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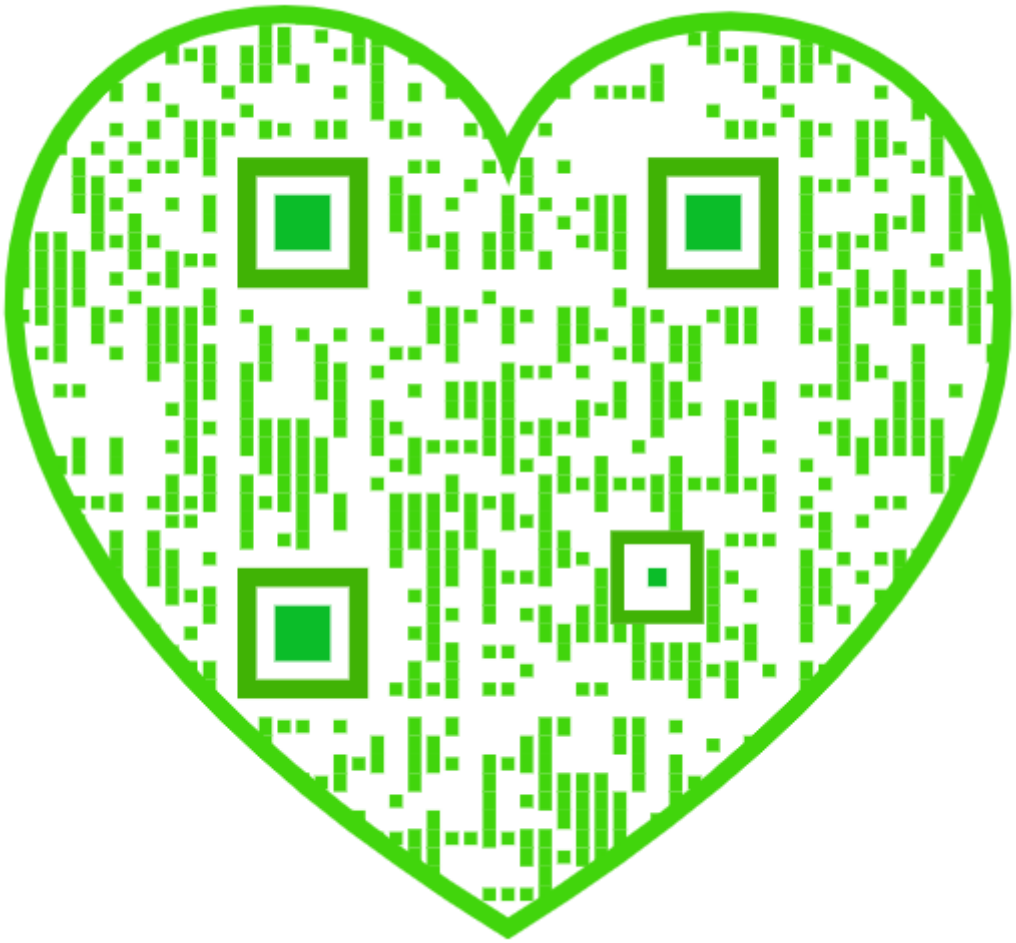

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HEALTH ON THE FARM

BY

H. F. HARRIS

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HEALTH ON THE FARM

A MANUAL OF RURAL SANITATION AND HYGIENE

BY

H. F. HARRIS

SECRETARY OF THE GEORGIA STATE BOARD OF HEALTH

New York

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INTRODUCTION

BY THE GENERAL EDITOR

This is the day of the small book. There is much to be done. Time is short. Information is earnestly desired, but it is wanted in compact form, confined directly to the subject in view, authenticated by real knowledge, and, withal, gracefully delivered. It is to fulfill these conditions that the present series has been projected—to lend real assistance to those who are looking about for new tools and fresh ideas.

It is addressed especially to the man and woman at a distance from the libraries, exhibitions, and daily notes of progress, which are the main advantage, to a studious mind, of living in or near a large city. The editor has had in view, especially, the farmer and villager who is striving to make the life of himself and his family broader and brighter, as well as to increase his bank account; and it is therefore in the humane, rather than in a commercial direction, that the Library has been planned.

The average American little needs advice on the conduct of his farm or business; or, if he thinks he does, a large supply of such help in farming and trading as books and periodicals can give, is available to him. But many a man who is well to do and knows how to continue to make money, is ignorant how to spend it in a way to bring to himself, and confer upon his wife and children, those conveniences, comforts and niceties which alone make money worth acquiring and life worth living. He hardly realizes that they are within his reach.

For suggestion and guidance in this direction there is a real call, to which this series is an answer. It proposes to tell its readers how they can make work easier, health more secure, and the home more enjoyable and tenacious of the whole family. No evil in American rural life is so great as the tendency of the young people to leave the farm and the village. The only way to overcome this evil is to make rural life less hard and sordid; more comfortable and attractive. It is to the solving of that problem that these books are addressed. Their central idea is to show how country life may be made

richer in interest, broader in its activities and its outlook, and sweeter to the taste.

To this end men and women who have given each a lifetime of study and thought to his or her speciality, will contribute to the Library, and it is safe to promise that each volume will join with its eminently practical information à still more valuable stimulation of thought.

ERNEST INGERSOLL.

TABLE OF CONTENTS

CHAPTER		PAGE
I	Importance of Our Subject	3
II	Care of the Person	12
III	Sanitation In and About the House	35
IV	Hygiene of Infancy and Childhood	63
V	Proper Eating — The Secret of Good Health	92
VI	Bread and Its Relations	104
VII	Meats, Sugars and Milk	117
VIII	Food-Value of Vegetables	130
IX	Danger in Fruits and Pickles	144
X	Drinks — Proper and Harmful	148
XI	Importance of Good Cooking	164
XII	Seven Avoidable Diseases	171
XIII	Hygiene of the Sick Room	217
XIV	Emergencies and Accidents	223
XV	What to do When Poisoned	251
	Appendix	273

HEALTH ON THE FARM

HEALTH ON THE FARM

CHAPTER I

IMPORTANCE OF OUR SUBJECT

Notwithstanding the extraordinary advances in a material way that have been accomplished in this country within the last few decades, it is a significant and most alarming fact that progress in hygienic matters has lagged far behind. Why this is, it would be very difficult to say,—for the reason that the causes are perhaps many. Chief among these, probably, is the fact that our progress along industrial lines has occupied the entire time of the majority of our best intellects, and it is also in no small degree the consequence of a fatalism that regards disease as a direct visitation of providence and therefore a thing which man may not avoid. Another cause in some instances is the

pride of our people in their homes and respective localities, which causes them to repel with indignation the suggestion that any special measures are necessary in order to conserve the public health where they reside. Ignorant as the average man is of the causes that produce sickness and the means by which this result is accomplished, he is naturally not in a position to form a correct judgment concerning such matters, and as a consequence, sees no reasons for taking the precautions that are necessary in order to ward off disease. This ignorance, it must be confessed with sorrow, is in a measure the fault of the medical profession, which has not in the vast majority of instances lived up to its ideals in this connection. Petty and unworthy rivalry has played an extremely important part in this failure of medical men to do their duty in this particular—none of the physicians of a community being, as a rule, willing that others should instruct the public, however vital this might be for the general good. As a consequence, that class of vultures known as medical quacks has furnished to the laity by far the greater proportion of their instruction

on hygienic subjects, with the result that the average man has a greater misconception and less real knowledge of such matters than of anything else in which he is vitally interested.

Another, and very curious explanation for our general disregard of the laws of health is that our strong belief in ourselves impels us to think that however much others may suffer from things generally regarded as unhygienic, we, ourselves, will be immune. This belief is fostered by the fact that in early life there often seems no end to our capacity to endure, and we find ourselves constantly defying without apparent harm, what we are told by others is directly contrary to all rules of proper living. But it is unfortunately true also that the reserve force and great power of resistance that enables us to do these things begins to wane towards the end of the third decade of life, and we, therefore, find ourselves sooner or later breaking down after we have become thoroughly convinced that we were made of iron, and that while other people might not be able to do as we were, it could not possibly result in evil in our own cases.

What a pity it is that the young will not learn from the experience of those who have gone before them! Could they only do so, how much suffering and woe could be avoided in this world. Unfortunately, however, there are few men so constituted that they are willing to be guided by the experience of those who have preceded them, and there is but a faint possibility, therefore, that any good can be accomplished by warning the coming generation of the troubles in store for them should they not heed the advice of those who have suffered before them. Notwithstanding this, the writer feels that these words of warning should be spoken to the young, since they, alas, are the only ones to be benefited by such advice.

As you value your happiness materially, and as you desire a healthy old age and a long life, inform yourselves as to the few simple laws that govern human existence, and attempt so far as lies in your power to follow them. If you do not do this, disaster will follow as surely as the night follows the day.

Apathy of the Public as to Hygiene.—As a partial consequence, probably, of all the reasons

mentioned, along with others, there exists in the popular mind a curious apathy concerning hygienic matters—an apathy so great that it is scarcely possible to get the average man to discuss, much less to put in practice the all-important laws that govern health. As a result of the work of the various State boards of health and of the Public Health and Marine Hospital Service, this condition of affairs happily shows some signs of abatement, and we certainly have reasons to believe that the future promises great things along these lines. No sign of this change is more significant than the awakening of the press of the country to the vast importance of instructing the public in health matters, and their changed attitude toward the charlatans and quacks who live by promising the impossible. Largely subsidized by the infamous vendors of patent medicine, our newspapers and magazines still lend their columns to these human vampires who prey pre-eminently on the ignorance and credulity of the hopelessly-diseased poor; but within recent years some of our foremost journals show signs of an awakening of conscience, and a very few have

even gone so far as to exclude advertisements of this character altogether.

It has been said, certainly with more or less truth, that we are creatures of our surroundings, but whether we accept this in its broadest sense or not, there can be no question that our well being is most intimately connected with those things with which we come into every day contact. *Nothing is more important for us to recognize than that our diseases are contracted from neighboring subjects just in proportion as we are closely associated with them.* From our fellowmen we contract, as everyone knows, a large number of diseases, either by direct contact or by means of the air that surrounds us. From the earth we get hook-worms and other animal parasites, either by coming directly in contact with it or through eating uncooked fruits and vegetables. From water we get typhoid fever, dysentery, cholera, and many other parasitic diseases. From our food we likewise contract dangerous maladies such as tapeworms from uncooked meats and fish and the deadly trichina from raw hog meat. With decomposed breads we take the poisons that

produce pellagra, kak-ke, ergotism and acrodinia. From uncooked fruits and vegetables we get dysentery, typhoid fever, cholera, and parasitic dieases. Spoiled beans give us the deadly lathyrismus. From decomposed meat and fish we get ptomaine poisoning. Mosquitoes convey to us malaria, yellow fever and a parasite known as the filaria. The dreaded sleeping-sickness of Africa comes through the bites of a small fly; the bedbug is believed to be the means of conveying a frightful disease known as kala-azar, and the house-fly often brings to us the germs that produce typhoid fever, dysentery, and probably other diseases as well.

The bubonic plague, which is one of the most frightful diseases known, is conveyed to man by the rat and mouse.[1] Hydrophobia is usually contracted from the bite of the dog, and it is a well-known fact that this animal often harbors a minute tapeworm, a single egg of which, when swallowed by the human being, is often followed by death. Both dogs and cats prob-

[1] See the volume in this Library, *Animal Competitors*, by ERNEST INGERSOLL, for the agency of rats and mice in the introduction and dissemination of plague and other diseases; and the means of destroying these pests of the farm.

ably convey diphtheria, and both unquestionably often have within their intestinal tracts tapeworms that occasionally infect children. With the exception of the rare disease known as glanders, the horse is not believed to be directly responsible for any of the maladies from which the human being suffers, but it is well established that fully 95 per cent. of houseflies hatch in the manure of these animals, and they, therefore, become indirectly responsible for some of the most serious diseases affecting the human being. It is thus seen that almost every object with which man comes in intimate contact is capable of conveying to him the poison of one or more diseases. If it were possible for us to separate ourselves completely from everything with which we are ordinarily associated there can be no question that the span of human life would be greatly increased, and that death from bacterial and parasitic diseases generally would no longer occur. All this is said not with the object of startling the reader, but to warn him of the dangers that surround him on every hand, and to urge a recognition of that which can so materially prolong his

life. Fortunately these sources of infection may be almost entirely done away with by a few simple rules of life, and the health and longevity of mankind must necessarily be directly proportionate to the care with which we observe them.

It is now in order to discuss in detail the subject of personal hygiene.

CHAPTER II

CARE OF THE PERSON

It is happily the case that in America the importance of personal cleanliness is more thoroughly understood, and is more generally practiced than any of the other important hygienic procedures. While it is true that there are many—particularly those of foreign extraction, and who live for the most part in the larger cities—to whom an occasional bath appeals only as a painful necessity, a very large percentage of those born in this country bathe regularly. It should be thoroughly understood that a daily bath is essential, not only from the standpoint of cleanliness, but from the fact that this practice is in the highest degree conducive to health. It should never be forgotten that by cleanliness infectious materials are removed from the surface of the body, and at the same time the skin is put into a condition to eliminate from the system those waste products

which it is its special function to remove. The close relationship of the proper activity of the skin to health is perhaps not generally sufficiently appreciated—for it is true that the body cannot remain normal when the secretory power of its glands is impaired, and that even death quickly follows when they cease to functionate altogether.

Advice as to Bathing.—Much difference of opinion exists as to the proper temperature of the water for bathing, some holding that it should be quite cold, while others are equally positive that it should be warm. Unfortunately it is impossible to give fixed rules concerning this somewhat important matter, for there is every reason to believe that it should be determined in each individual case according to circumstances, and that, therefore, both may be right. Some persons unquestionably do better with one, and some with the other. It has been established clearly that the cold bath is highly stimulating, and where not too prolonged, and when followed by vigorous rubbing, is undoubtedly healthful for a large number of people. The cold bath is often used by physicians

in the treatment of diseases of low vitality. Many persons however, are unpleasantly affected by bathing in water of a temperature much below that of the body; particularly is this true of women, and the like may be said of thin and nervous persons of the other sex. It is claimed by the advocates of the cold bath that those who practice this procedure daily are practically immune from colds, but this, certainly, is not always true; on the contrary the writer has seen instances where the cold bath has unquestionably led to chronic nasal catarrh, with increased tendency to inflammatory conditions of the air passages. It is also the case that baths of this description tend in some persons to prevent a normal accumulation of fat beneath the skin, and keep individuals of this kind unnaturally lean.

The warm bath is perhaps, on the whole, more popular than the cold, since it is preferred usually by children and women, and is practiced by a considerable proportion of adult males. It is unquestionably somewhat enervating, and at best fails entirely to give the agreeable stimulation experienced by those who take a

cold plunge. It is, however, to be preferred in those instances where cold water produces disagreeable effects, and if the bath be not too long continued it is followed by no ill results. Persons who become lean under cold baths not uncommonly take on flesh when they begin to use warm ones. It is unquestionably true that the latter is to be preferred in hot climates.

The sea bath is invigorating not only from the water being cool, but as a consequence of the pleasurable excitement with which it is attended. Its greatest disadvantage lies in the fact that there is a tendency to overdo it, many persons remaining in the water for hours. Ten or fifteen minutes is as long as the average person should indulge in sea-bathing, and it is a question if even those who are young and vigorous should remain in the water longer than half an hour.

Bathing of any kind should be indulged in before meals, the best time being before breakfast in the morning.

Care of the Teeth.—Nothing in connection with the subject of personal hygiene is of more importance than keeping the teeth properly

cleansed. The fact is not generally appreciated that sound teeth stand in a most intimate relationship with good health, and that disastrous consequences are sure to follow sooner or later where these most important structures are neglected.

While it is true that in a person of vigorous health one or two decayed teeth do not, as a rule, occasion obvious trouble at once, ill effects are sure sooner or later to be felt. For one thing, a person without good teeth cannot chew his food well. Those who begin by neglecting what at first are slight defects in the teeth seem to acquire in the course of time a sort of habit of doing this, and ultimately disregard and fail to have corrected the more serious diseases of the dental structures. Nothing is more common than for the practicing physician to find patients with one or more teeth partially gone, or, even worse, with only the exposed roots remaining.

Where cavities exist, food is constantly forced into them, and undergoing decomposition, the breath of their owner becomes foul, and portions of decayed food mixed with multitudes of

bacteria are constantly swallowed; sooner or later there inevitably follows under such circumstances catarrhal conditions of the stomach, which reaches a point in some individuals where the health is seriously threatened. Not only do bad teeth produce trouble in the way just mentioned, but there is every reason to believe that germs that produce disease—particularly those that cause consumption—not uncommonly find their way to the interior of the body through the resulting cavities.

It is the duty of everyone to properly cleanse the teeth at least once daily—to do so after each meal would be even still better. This should be done with a moderately soft brush, with which it is unnecessary to use tooth-powders or lotions—though many prefer to do so. Where something of the kind is desired, ordinary lime-water is perhaps as satisfactory as anything else; peroxide of hydrogen, diluted eight or ten times with water, to which a pinch or two of ordinary cooking soda has been added, undoubtedly aids the cleansing process, and has the advantage that it leaves a pleasant after-taste in the mouth. In brushing the teeth care

should be taken that every part of the tooth receives attention, it being not sufficient, as is so often done, merely to brush the front. It should be the practice of everyone to have the teeth looked over at least once a year by a good dentist, as even where cleansing is diligently performed decay frequently sets in on their inner sides.

The utmost care should be taken of the permanent teeth especially, and as long as it is possible to prevent it no one should be allowed to pull them. There can be no doubt that life is shortened by the early loss of the permanent teeth in most, if not in all, cases—not to count loss in health and happiness that follows their absence.

Clothing,—Material and Color.—Clothing will be considered in this article only as regards its function of properly protecting the body, which it does by preventing the escape of heat, thus keeping the body warm, or, under other circumstances, by keeping out excessive heat or cold.

Materials of which clothing is made differ very greatly in their ability to accomplish the

object just mentioned, some being comparatively poor conductors of heat and hence fulfill the desired function admirably, while others, for opposite reasons, are of comparatively little value for this purpose. In general it may be said that structures of animal origin, such as wool and silk, are much poorer heat conductors than those obtained from the vegetable world, and as a consequence the former are justly held in much higher esteem as material for clothing than the latter. It should not be forgotten, however, that the protective value of a fabric also depends upon the manner in which it is woven, since those that are loosely constructed are much warmer, other things being equal, than those that are put together more closely; this depends upon the fact that in the former there are innumerable small cavities between the fibers in which air is contained, and as this substance is a very poor conductor of heat, it follows that a garment made loosely and containing many such chambers is warmer than where the number is less. It may well be the case that a fabric constructed of a material which is a poor conductor of heat and closely woven

may be actually cooler than another composed of a substance which is a much better conductor of heat but of a loose texture.

The efficiency of different materials of which clothing is made also depends upon their capacity to absorb water. This may be done in two ways: the water may simply collect between the fibers, in which case it may be in a large measure removed by wringing, or it may be actually absorbed into the substance composing the fabric, and, as a consequence, the latter, even though containing much moisture, do not appear damp. Fabrics made from vegetable materials, as cotton or linen, have little power of actually absorbing water, and hence they become wet on the slightest addition of moisture, while on the other hand those of animal origin have the capacity of absorbing water, and appear dry even after the addition of this substance in considerable amounts. A person, therefore, dressed in cotton fabrics will find after active perspiration has begun that his clothing quickly becomes moist, while if he have on woolen garments this will not occur. It is particularly noteworthy that water is

gradually removed by evaporation from animal fabrics, which causes a general cooling without producing a chill; it is therefore readily understood that woolen clothing is much to be preferred where active exercise is being taken.

Color is also of some importance in determining the value of a fabric for protecting the body from the sun's heat. Within recent times we have learned a great deal respecting the wonderful penetrating power of the invisible light rays, and we have every reason to believe that these modify to a very considerable degree every process going on within the body. The violet and ultra-violet rays are those that unquestionably exert most influence, and it has been suggested that they may be broken up and rendered innocuous by covering the body with materials having a reddish-yellow color. It is not necessary to put these materials on the outside where they would be conspicuous, but they may be used as lining for hats and clothing; and there are good reasons to believe that if their use were generally adopted suffering and actual loss of life from overheating would be greatly reduced, particularly in warm countries.

Work and Rest.—Very slowly the people of our country are beginning to realize that it is quite as necessary to rest as to work, though unfortunately in some quarters a strenuous life is urged as being only secondary in importance to possessing a big family; that there is an intimate association between the two there can be no doubt, since the latter beyond peradventure would entail the former. It has ever been the habit and misfortune of sages now and then to desert the field of their own peculiar activities and to make incursions into unknown regions—generally giving advice with a dogmatism and finality proportionate to their ignorance of the subject under discussion.

As a matter of fact the average American works entirely too much, and while he sometimes accumulates an immense fortune with astounding rapidity, to his sorrow he often learns later that he has likewise acquired a damaged heart, premature thickening of his blood-vessels or nervous dyspepsia with all of its attendant evils. Descended as we are in a large measure from the most vigorous and adventurous Europeans of the last few centuries, and coming into

possession of a new world where everything was to be done, this tendency to overwork is most natural,—and for this reason is all the more to be combatted. That we have been able so successfully to carry the burden for several generations is indeed remarkable, but there are not wanting numerous indications that the strain is beginning to tell. If we do not call a halt, and devote more time to rest and agreeable pastimes, disastrous consequences are sure to follow, and we will become in the course of time a race of neurasthenics and degenerates. Attention should likewise be directed to the fact that men do not develop to the highest point of mentality who devote their entire time to work, as leisure is absolutely essential for thought and the development of all that is best in man.

Let us then cast aside the shallow and ignorant preachments of those who do not understand the subject, and devote a reasonable time to the reading of good books, to thought, to the cultivation of the arts and sciences, and to pleasurable pastimes. In these particulars we are far behind Europe, and we shall never take

our place as an intellectual people until we radically change our method of life. A nation must dream before becoming great. Let it not be understood from the foregoing that the writer would in the slightest degree minimize the necessity for a reasonable amount of work, for he thoroughly appreciates that without labor neither the individual nor the nation itself could remain sound—it is only urged that excessive work is quite as much to be feared as none at all.

Health and Labor.—As to the number of hours that should be devoted to labor no rule can be laid down. It all depends on the age, physical and mental vigor of the individual, and likewise, to a considerable degree, on the character of the work. Occupations requiring intense mental or physical strain can only be kept up for short periods of continuous application, while, on the other hand, quite naturally, those of a less strenuous nature would permit longer hours. The young man, in pride of perfect bodily and mental vigor, too often assumes, because he has been able in the past to do pretty much anything that pleased him without ill-ef-

fect, that he can continue to do the same through life. No greater mistake could be made.

Anything that has a tendency to undermine the health, repeated sufficiently often, will ultimately cause a complete breakdown. How often do we see the strength and beauty of early manhood blighted and turned to premature old age and death as a consequence of disregarding the warnings that have just been given! How frequently do we observe young men rejoicing in the emancipation from home and school and spurred on by the fatal delusion that while others might suffer they will not, becoming in the end the victim of that arch enemy of early manhood, consumption! Every practicing doctor has seen this, not once, but hundreds of times, and in the vast majority of instances he can say with truth that the frightful result is a consequence of overwork—too often associated with nocturnal dissipation. The man who works during the day, and devotes his nights to alcohol and gay company when he should be sleeping, will assuredly, sooner or later—and usually sooner—suffer the inevitable consequences.

To those who live sedentary lives, active outdoor exercise is very essential, but inasmuch as this little volume is being written for those who live a saner and more healthful existence, it is not deemed necessary to discuss here this phase of the subject.

Value of Sleep.—Closely connected with the subject just discussed is sleep. Here also we have no rules, or laws, from which we can clearly determine the amount required in individual cases. Overwise philosophers have asserted that seven hours for a man, eight hours for a woman, and nine hours for a fool, was the allotted time for sleep. As a matter of fact, the necessity for repose varies greatly in different individuals, some of them requiring less while others demand more. It is a safe rule to follow that every man should sleep as long as he naturally desires, for nature is a much better mentor than any man could be—however learned. The majority of men require at least eight hours of sleep for the day and night, and this should be secured if possible at such a time as will permit it to be undisturbed; hence it is that man usually prefers to sleep at night, and,

all things considered, it is probably the time best suited for his repose. We read many marvelous stories of certain great men who required little or no sleep. Within recent years the press has frequently contained articles recounting the extraordinary fact that a certain prominent inventor of this country lived daily on a mere spoonful or so of food, and only slept a few hours now and then when there was nothing else particularly to do. Such stories should be accepted only on absolute proof, as, irrespective of their utter improbability, one may observe that they are generally insisted upon in and out of season with a pertinacity that would indicate that they were conceived and are scattered abroad with the sole idea of impressing the general public with what a marvelous and unusual person the individual in question is. There can be no reasonable doubt that they are merely evidences of childish vanity and puerile mendacity, and are only referred to here for the reason that young persons, ignorant of the laws of health, might attempt to emulate them, with results that could be but disastrous. *Nothing so preserves youth, health,*

and good looks as a sufficient amount of sleep, and it is pre-eminently the secret of long life.

Reference will be made in the chapter on the Hygiene of Infancy to the necessity of children sleeping as much as is possible. It will do no harm to say again here that nothing is so essential for the proper development of the body as sleep, *and that it is absolutely a crime to awaken a child except under circumstances of absolute necessity.*

Precautions in Respect to Eating.—A sufficient amount of sleep, and a proper quantity of digestible and nutritious food, thoroughly cooked and carefully masticated, are the things which above all others are most important for the maintenance of health. In the chapter on Foods, the nutritive values and digestibility of the various articles eaten by man will be discussed with sufficient thoroughness to instruct the reader as to a wholesome dietary; it is, therefore, not necessary here to go into the matter fully, but the subject is so important that a few general remarks will not be out of place.

Eating should never, so far as is possible, be hurried. Nothing is more important for the

proper digestion of food than its thorough mastication, and this can only be accomplished when sufficient time is allowed for eating. It is not necessary that this be done to the extreme advocated by some, but it is certainly of the highest importance that the food be so thoroughly chewed that it is reduced to fine particles, and that it should be so soaked in saliva that it may be swallowed without the aid of liquids of any kind.

It is also desirable that food should not be taken while the individual is tired, so that it is a good plan where this condition exists for one to lie down for a short time before eating.

Regularity in eating is likewise of importance, it being best to take the meals at stated periods; the consumption of food at irregular hours often leads to indigestion and is a practice which should not be indulged in.

It is highly desirable to have food served under agreeable circumstances, digestion being accomplished in a much more satisfactory manner if pleasant conversation be indulged in during the meal, and if the food be of an appetizing character. Nothing is of more importance

in connection with this subject than to have the food properly prepared. Not only is thorough cooking important from the standpoint of making foods digestible, but as is shown in another part of this volume, grave and sometimes fatal diseases are contracted by a neglect of this important procedure.

Fruits, contrary to what is generally thought, contain but little nourishment, and severely tax the digestive powers of those who have a tendency to dyspepsia. When eaten at all, they should be perfectly ripe and fresh, and should always be taken after meals rather than before.

Drinks,—Coffee, Tea, Milk, etc.—Much misconception exists, among people generally, and even among the medical profession, concerning the proper amount of water that should be drunk. While this substance is unquestionably the most wholesome of all drinks, there exists no necessity for taking it in great quantities at times when the system does not call for it. It would perhaps be a good rule for all to form the habit of drinking little while eating, the reason for which will be explained hereafter.

Coffee is exceedingly popular both on account

of its delicious odor and taste when properly made, and for the reason that it is highly stimulating. While it is borne by young and vigorous persons of either sex with apparent impunity, there frequently comes a time in life when it can no longer be drunk without ill effects. As a general rule, dyspeptics do not bear it well.

Tea, if properly prepared, is a most palatable beverage, and one that is generally better borne than coffee. It is more wholesome when taken without lemon juice, and like coffee it is less disposed to produce trouble if largely diluted with milk, or if taken without cream or sugar.

Cocoa and chocolate are often used as substitutes for tea or coffee, and where they agree with the individual are perhaps as wholesome as either. Both, however, contain considerable quantities of fat, and as they are frequently prepared with cream, or very rich milk, they are not as a rule well borne.

While milk might be considered as being almost as much a food as a drink still the fact that it is fluid, and that it contains a very large percentage of water, causes it to be regarded

as a beverage. When taken slowly—and this precaution is particularly necessary where it is fresh and sweet—milk is a drink that should be regarded as being on a par with water. It contains no injurious substances, but sour milk should, as a rule, be avoided by dyspeptics.

The cardinal principle in taking beverages of any kind at mealtime is that they should be drunk alone after the food has been swallowed, as when they are taken with the purpose of softening the latter, mastication is seriously interfered with and the proper soaking of the food in the saliva prevented.

Alcoholic Beverages.—Alcoholic drinks are so fully discussed in a latter part of this book that here it may merely be stated that they cannot be regarded as having food-value to any degree, and so far as the matter is at present understood, appear to be entirely superfluous, and even positively injurious. If taken at all, they should be consumed in extreme moderation, after meals rather than before. The young especially should be particularly warned against the use of all beverages of this class.

A Word on "Soft Drinks."—Mention should

also be made of those drinks commonly sold at soda-fountains. The vast majority of them may be taken occasionally without any appreciable ill effects, but the habitual use of beverages containing considerable quantities of syrup is not entirely wholesome. Particularly is this true where the drink contains stimulating drugs, such as do some of those most advertised. Some of them are, if no worse, the equivalent of a strong cup of coffee, and should, therefore, no more be taken every hour or two during the day than a cup of the substance just mentioned. If their use is persisted in, it is sure to be followed by indigestion, and in many instances nervous disorders of even a serious character. The reader should also be warned against the use of drinks containing medicine for the relief of pain —particularly those that are advertised as remedies for headache. Practically without exception, all such drinks contain coal-tar preparations that greatly depress the heart, and have in a number of instances been followed by death. Drugs of this character should be taken with the utmost circumspection, and only on the prescription of a competent physician.

Tobacco.—Tobacco, of all nerve sedatives, is the most universally used. In moderation it could not be said that it is followed by any apparent ill effects in the majority of people, but if used in excess oftentimes sets up serious disturbances. It is peculiarly injurious to boys, and should never be indulged in until manhood is reached. Some persons seem to possess a natural immunity to the ill effects of nicotine, and appear to be able throughout their lives to chew or smoke tobacco in any amount without harmful results; such instances are, however, rare—its excessive use being usually followed by symptoms that may be of a serious nature. Of the two methods of use perhaps smoking is less open to objection, though it is unquestionably true that chewing is not so apt to cause disturbances of the heart. Smoking affects the stomach, but not to the extent that chewing does.

CHAPTER III

SANITATION IN AND ABOUT THE HOUSE

The bearing of intelligently located houses of proper construction on health is not so generally understood, even by physicians, as the facts warrant, and, of course, is even less well recognized by the non-medical public. It is true that some attention has been given to the matter of *location,* but even in this connection there prevails a woful ignorance among all classes as to just how the diseases are transmitted that are most influenced in this way. As a result of recent advances in medicine it has been clearly shown that at least some of the diseases that are most influenced by locality may be easily avoided, and as a consequence we find that the views of the modern sanitarians have necessarily undergone a certain amount of change in this direction. On the other hand recognition of the necessity of hygienic *con-*

struction has not been sufficiently accentuated,—since it is possible by proper attention to the details of building to do away entirely with at least two of the diseases that have heretofore been the principal drawbacks to life in all tropical and sub-tropical countries. Much importance likewise attaches to houses being thoroughly ventilated, and to their being sufficiently roomy to properly accommodate their inmates. The following table shows the striking relationship that mortality bears to overcrowding:—

RELATION OF DEATH-RATE TO DENSITY OF POPULATION.

City.	Mean number of inhabitants to each house.	Average death-rate per 1,000 inhabitants.
London	8	24
Berlin	32	25
Paris	35	28
St. Petersburg	52	41
Vienna	55	47

Many other statistics could be quoted, but all follow the general trend of those just given.

Choice of Site.—In our rural districts the inhabitants have a wide latitude in the matter of the selection of the location for their houses,

and it is usually the case that our people are sufficiently intelligent to make the best use of their opportunities in this direction. It may, however, be mentioned that it is generally considered that building-sites in the neighborhood of cemeteries are not favorable locations, nor should houses be erected in the vicinity of a manufacturing plant that gives off injurious gases, or obnoxious materials of other kinds. Inasmuch as we now know that malaria is transmitted by a certain mosquito, and that by properly screening the house their attacks may be avoided, the necessity no longer exists for avoiding the vicinity of lakes and rivers as building-sites; such localities being as a rule pleasant and often picturesque, they would naturally under ordinary circumstances be selected, and there now remains no reason why this may not be done,—provided that the house is so constructed that mosquitoes can be effectually prevented from gaining entrance.

Of much importance is the selection of a locality where good and pure water can be easily procured, as otherwise disastrous consequences are sure to follow.

The soil should be of a light and porous character, easily permeable by water, and free from the descomposing remains of excretions of man or animals. There is much reason for the belief also that the level of the ground-water plays a somewhat important part in the salubrity of any given locality, and it is generally considered that this should be at least ten feet below the surface. It is generally thought, and probably with truth, that those sites are most healthful which have their location on a basis of granite, or other rock-foundation; in such localities there is usually a considerable slope of the general surface of the ground, with the result that water rapidly runs off after rains, and consequently stagnant pools, which might serve as a breeding place for mosquitoes and bacteria, do not form. Soils through which water easily permeates are likewise, as a rule, healthy, though this depends in a measure upon whether or not they contain a very considerable proportion of vegetable matter. Clay foundations are healthful where there is a considerable slope to the surface of the ground, but where this does not exist the soil is damp, owing

to its impermeability, and often has stagnant pools upon its surface. Marls and alluvial soils are not regarded as being wholesome, but it is not unlikely that their bad reputation is largely due to the fact that they generally exist in the neighborhood of rivers and other considerable bodies of water where mosquitoes are numerous. There are no reasons going to show that cultivated lands are unhealthy—even where they receive yearly abundant additions of manure. Where it is necessary to build in damp localities the site should be thoroughly drained, and the space upon which the house is constructed should be carefully covered with some impermeable cement.

Building Materials.—Of all building materials, the one most commonly employed in America is wood. This arises from the fact that in the past we have had unlimited quantities of timber from which lumber could be procured at a price so reasonable that no other material could ordinarily be considered. That the wooden house has some advantages cannot be denied; its walls rapidly cool following the torrid days that so commonly occur during the

summer in almost all portions of the United States, and it is usually well ventilated as a result of the numerous fissures naturally existing in its structure.

Next to wood, bricks are most commonly used for building purposes, and have many advantages, among which are their handsome effect, their stability, and their being poor conductors of heat; the last mentioned is of considerable importance, since it keeps both heat and frost from rapidly permeating the interior, and as a consequence houses constructed of this material are cooler in summer and warmer in winter.

Other materials occasionally used are concrete, granite, marble, and sandstone, any of which, on account of their durable character and the beauty that they lend to structures made from them, may be selected for building purposes, but inasmuch as they are rarely used in rural districts, a detailed consideration of their peculiar advantages for building purposes is not deemed here necessary.

The internal wall-coating of houses deserves more consideration than is commonly accorded it, since the dyes used for coloring wall-paper

and curtains in some instances contain noxious materials. Chief among those that are dangerous are the bright green pigments which commonly contain arsenic as their principal constituent; where these or other poisonous substances are employed in interior decorations the air, wherever the room is kept closed, may become more or less impregnated with poisonous gases, and serious consequences to the inmates may ensue.

Screening Indispensable to Health.—Nothing is more important in connection with house construction that having every opening thoroughly screened. We have learned that both malaria and yellow fever are transmitted always by certain kinds of mosquitoes, and it therefore, becomes a matter of the greatest importance to effectually prevent the entrance of these insects. It cannot be too strongly insisted upon that we absolutely know that the statement just made is correct, and that avoiding the diseases referred to becomes as a consequence entirely a matter of preventing the entrance of mosquitoes into houses.

The *Anopheles* mosquito, which is the one

that transmits malaria, often exists in localities where the more common varieties do not occur, and on account of the habits of this insect their presence is liable to be overlooked. They seldom attempt to bite during the day, and it is only rarely the case that they try to do so at

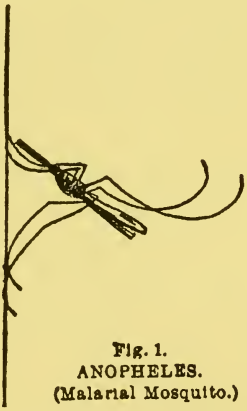

Fig. 1.
ANOPHELES.
(Malarial Mosquito.)

Fig. 2.
CULEX.
(Common Mosquito.)

night in a well lighted room;—particularly where movement of any kind is going on. During the day this mosquito remains perfectly quiet in the dark corners of the house, and is very fond of resting on cobwebs, presenting, when doing so, an appearance strikingly similar to that of fragments of leaves, soot or of other natural objects that are frequently found

suspended on such structures. On account of these peculiarities and for the further reason that the insect bites mainly just following daybreak, when the victim is profoundly unconscious in sleep, its presence often remains undetected, and as a consequence we occasionally hear from those who do not take the trouble to inform themselves that malaria exists in this or that locality where mosquitoes do not occur.

The yellow-fever mosquito bites for the most part during the day, but will do so at any time when there is light. In districts where this disease occurs it is quite as important to prevent its entrance as that of the malarial mosquito. Not only does screening prevent malaria and yellow fever, but it keeps out flies and other insects that unquestionably bring with them the germs of other diseases.

There now remains no doubt that several affections, notably typhoid fever and dysentery, are frequently communicated by means of the common house-fly, which spends its time alternately on the fecal material around privies or in other filth, and in our kitchens and dining-rooms; it is one of the most astounding evi-

dences of the power of habit, in the face of common sense and ordinary decency, that we have not long ago taken active steps to rid ourselves of its disgusting presence. Fortunately in screens we have a perfect barrier to the entrance of flies, and no house can be considered complete without being thoroughly equipped with these all-necessary appliances.

It is scarcely possible to overestimate the economy that results from the use of screens; among the various means employed for conserving the public health they take first rank, and undoubtedly insure those who live in houses to which they have been added an immunity against the costly effects of disease that could scarcely be computed. A house would be more habitable without chairs, beds, or tables than screens, since in the absence of the former we may be healthy, though somewhat uncomfortable, but without the latter serious disorders are pretty certain, sooner or later, to make their appearance.

It is of considerable importance to use a screen the mesh of which is sufficiently fine. Where mosquitoes exist, the screen should be of

such fineness that at least sixteen, or better eighteen meshes be in each inch of the gauze. Where it is absolutely certain that mosquitoes are not to be feared, the spaces may be somewhat larger—but always of such size as will prevent the entrance of the smallest fly.

Air-space Required.—It is of much importance from a hygienic standpoint that the rooms of dwellings should be sufficiently large. The height should never be less than eight feet, and the living-room should be made as large as circumstances will permit. Bed-chambers should contain at least 1,000 cubic feet of air space for each adult, with somewhat less for children, though it should never be forgotten that the more the better; this means that each person should have the equivalent of a room which is at least 10 x 12 x 9 feet.

Heating.—Americans are extravagant in the matter of heating to a degree that astonishes the average foreigner, and it is by no means sure that we do not go to unhygienic extremes in this direction. It is not, perhaps, true that the excessive heat itself could be considered as especially hurtful, but it is too often the case that

the conditions required to secure the degree of heat preferred by us are incompatible with proper ventilation, and hence are to be condemned. It is generally considered that the temperature of living-rooms should be somewhere about 70° F.; for many persons this is lower than would be entirely comfortable, and as a consequence our houses in the winter are frequently kept nearer 80° F. than the figure just given. The reader should be urged to see to it that, at whatever temperature his habitation is kept, a sufficient amount of ventilation be secured.

There are many different methods of heating, the most satisfactory of which are by means of hot water or steam; a modified form of the latter is the so-called vapor method, which in recent years has proven extremely satisfactory. Hot air, supplied by a furnace is also extensively used, and for the reason that by this method fresh air from the outside is constantly brought into the house, it is theoretically to be commended; practically, however, a considerable difficulty is experienced in securing an equable distribution of this heat throughout the

various parts of the house, and as a consequence it has not achieved the popularity that it would otherwise have done.

Inasmuch as the installation of plants for heating by the methods just referred to entails quite an expense, and for the further reason that they require coal for satisfactory operating, they have not been employed in the rural districts of America to any considerable extent. The farmer, for the most part, depends on the old open fireplace where wood is plentiful and the weather does not become excessively cold, while in those portions of the country where the temperatures in winter go very low, the stove is generally employed. Of the two methods, the former is much the more hygienic where it can be used successfully, but over a greater portion of the United States this cannot be done owing to the cold winter climate.

The principal objection to the stove lies in the fact that the heat that comes from it is very dry, and that where its walls have to be heated excessively, unpleasant odors are apt to be generated; the former is usually and ought always to be obviated by keeping upon the stove

a vessel of water, the vapors from which moisten the atmosphere, and the latter by having the stove of such size that it will not require excessive heating in order to warm the room in which it is placed. Wherever possible the open fireplace is to be preferred to the stove for the reason that it very thoroughly ventilates the room.

Ventilation.—In order that the health of the inmates may be conserved proper ventilation of all habitations is essential. However cold the weather may be, an abundance of fresh air should be allowed to enter all parts of the house. In the average wooden dwelling there are so many cracks that good ventilation is generally secured without opening doors or windows, but where the construction does not permit this, openings for the entrance of air should be left in the most convenient and suitable places. Windows may be slightly raised and draughts prevented by proper screening, or what is even better, rooms should be so constructed that they have openings at the top and at the bottom to allow free ventilation. Openings towards the upper portion of rooms are especially impor-

tant in hot weather, as the warm air rises to the ceiling and escapes only very slowly where such exits do not exist. Lowering windows from the top aids materially in allowing the hot air to escape, but this is not altogether so satisfactory as having openings higher up on the walls, or in the ceiling.

Disposal of Sewage. No problem that confronts the dweller in the rural district is of greater importance than the proper disposal of sewage. It is unfortunately impossible in most instances for the farmer to have in his house a system of water-works, and, therefore, all dish-waters and slops are thrown into the yard, and a privy is used instead of a modern water-closet. Where the lay of the land is such that water readily runs off, or the soil is of a character that permits rapid absorption, throwing slops on the ground around the house may not constitute a danger to the inmates, but nothing is more certain than that the old fashioned privy is a dire menace to the health of all those in its vicinity.

Not only are infectious materials brought into houses by flies, from fecal matter and other

excretions, but they are carried away by the rains and sometimes contaminate sources of water-supply. It is furthermore extremely probable that bacteria in particles of dust from dried fecal material may be carried by the winds from privies into wells and houses, and as a consequence diseases may be spread; of perhaps still more importance—and certainly of far greater moment all over the southern portions of the country—is the fact that hook-worm disease and other infections caused by animal parasites are transmitted from man to man as the result of our adherence to the old fashioned privy.

As will be explained in the chapter devoted to the common communicable diseases, the eggs of the hook-worm pass from the intestine along with the feces of those who are victims of this parasite and reaching the ground, hatch out in the course of a few days minute hook-worm embryos, which crawl away and permeate the soil in the vicinity; later collecting in little pools that form after rains, or in dew-drops during the night, they attach themselves to the skin of barefooted children who come in contact with such

collections of water, and boring into the body ultimately, through a circuitous route, reach the intestines. Here they undergo further development, and in a short time become mature hookworms, which in their turn lay eggs, and the life cycle begins over again. It is thus seen that a child having hook-worm disease becomes a menace, on account of the privy, to its brothers and sisters, and of course quite commonly receives back into its own body, worms that had previously escaped as eggs.

In the same way eggs of the two common tapeworms pass out with the feces, and the offal containing them being eaten by hogs in the one case, or being scattered in the vicinity and taken in with grass by cows in the other, have their shells dissolved off as soon as they reach the stomachs of these animals, and there are liberated small embryos that bore through the walls of the stomach and later find their way into the muscular tissues of these beasts, and there lie dormant until eaten by man with imperfectly cooked meat; after being swallowed, the embryo parasite passes to the intestine and soon becomes a fully developed tapeworm.

Particular reference at this point should be directed to the evil effects, which are even still greater than those that come from the privy, of permitting children and hired helpers to scatter their feces indiscriminately in corners of the yard, the apple-orchard, or in the horse-lot; under such circumstances, where hook-worm disease is once introduced, the soil in the course of a short time becomes thoroughly permeated with the embryos of this worm, and, as a consequence, all of the children who play in the infected area barefooted, as is customary in the country, are sooner or later infected with these parasites. It is thus seen that soil-pollution from fecal material is a most dangerous thing, and, particularly in the southern portion of the United States, deserves the most earnest consideration of everyone. We should see to it that our children only evacuate their bowels in properly constructed closets; and it is the duty of the head of every family to provide such a place for the accommodation of those who are dependent on him.

Proper Construction of Out-door Privies.— The most practical and generally satisfactory

device heretofore invented for the disposal of the sewage of communities unprovided with water-works is what is known as the Rochdale, or dry-closet, system. By this system a privy, at a distance from the dwelling, is constructed in the ordinary manner, with the exception that instead of being open at the back it is tightly closed. In the space beneath the seat receptacles are placed for receiving the urine and feces. These may consist of pails of wood or better of galvanized iron; or a single box occupying the whole space. If wooden receptacles are used, they should be thoroughly coated on the inside with tar, to prevent both leakage and the soaking of the liquids into the wood. One such structure, which the writer knows has been wholly satisfactory has a brick foundation with walls two feet high around the front and sides, within which rests a shallow tarred box. It ensures perfect cleanliness.

In any case this space under the seat is tightly closed, being guarded by doors that open outward, through which the pails or box may be introduced and removed for emptying.

Each privy contains a box in which is placed

either wood ashes or dry powdered earth, with a small shovel by which a sufficient quantity of the dust to cover the deposit is thrown into the pail after each evacuation. It is remarkable how completely this shovelful of earth or ashes destroys all disagreeable smell. The privy should be provided with at least two opposite windows, both of which should be thoroughly screened. The entrance should have a door that is closed with a spring, so that it cannot be carelessly or accidentally left open when vacant. At intervals the pails containing the feces are removed, and the contents are carried to a distance and buried.

Another plan that is quite satisfactory where iron pails are used, is to place a quantity of water in the vessels for receiving the feces, and then to pour in a small quantity of kerosene; the latter substance forms a layer over the water that keeps out flies, and does away largely with the disagreeable odors that are likely to emanate.

If any contagious disease exists among those who use such a closet, the fecal material should be carefully sterilized before being removed, as

by means of corrosive sublimate, carbolic acid, chlorinated lime, or any one of the many commercial disinfectants containing crysylic acid, all of which may be obtained at any drug store. If carbolic acid or other liquid antiseptics be used the amount by volume should be equal to about five per cent. of the material to be treated; the proportion of corrosive sublimate should be at least 1 to 1,000 where this disinfectant is used. Along with whatever antiseptic is chosen, water should be added in sufficient quantity to permit the whole to be rendered semi-fluid, and the mixture should then be thoroughly stirred, and the chemical left to act for some hours before emptying the receptacle. By far the most satisfactory method of sterilizing infected material, however, is by boiling, since disease-germs are killed by such a temperature in a few moments. Where iron receptacles are used, therefore, the simplest method is to set them upon an open fire in the yard for a little while.

A privy constructed after the manner just described possesses some advantages even over the regulation water-closets that are used in

cities, since they are cheaper in original cost, require less repairs, and are uninjured by a freezing temperature. The amount of care required to keep them in proper condition is not excessive, and they are so infinitely superior from a hygienic standpoint to the old-time privy that no sort of comparison is possible.

It should always be remembered that the principal advantages of this closet are that where it is used we are able to collect all of the evacuations, which may then be properly deodorized with soil or ashes, and that it may then be finally disposed of in such a way that it cannot be reached by hogs or other animals; of very great importance also is the screening of the closet, since only in this way is it possible to prevent flies from gaining entrance to the fecal material in the receiving pails.

Water supply.[1]—In the location of houses and schools an eye should always be had to

[1] This subject is fully treated in another volume of this Library, entitled *Home Water-works*, written by PROF. CARLETON J. LYNDE. It shows where water should be sought, and how it may be supplied under perfectly safe conditions to the household, with descriptions of machinery, estimates of expense, etc. This thoroughly practical book meets a widely recognized need for information, and is written by a specialist.

selecting a site where it is possible to obtain good, pure water. To those fortunate dwellers in the mountainous regions of our country this is usually a matter of little difficulty, since it is always possible to find a location in the neighborhood of which the purest spring water may be obtained. In less favored regions the well becomes the main reliance, while cisterns are used in some portions of our country, in which water is collected during the rainy seasons of the year. Of the two, the former is undoubtedly to be preferred, provided a pump be used instead of the old fashioned bucket. The writer is strongly of the opinion that a very large proportion of the contamination to which sources of water-supply are subject comes from the bucket being drunk from or handled by persons with contagious diseases, or from germs

Thousands of men living in rural parts of the United States and Canada, out of reach of a public water-system, have equipped their homes with water-supply conveniences equal to any found in the cities. Thousands more who could well afford to do so and who could do so advantageously, have not done so for various reasons—because the idea has not occurred to them, or because they did not know how to go about it, or because they mistakenly thought the expense too great. To all such this book should prove of the greatest practical help.

being blown into the well with dust, or carried in by means of insects and small animals. It is inconceivable that any appreciable amount of contamination from the surface can reach the underground streams that supply wells in localities that are thinly populated, though it is unquestionably true that a well might be infected as a result of the entrance of surface-water where its top is not properly protected. On the other hand we have in an open well or cistern every facility afforded for the entrance of bacteria.

It is unquestionably of the utmost importance that wells be carefully covered over, and every precaution should be taken to prevent surface-water leaking into them around their edges. In order to comply with these conditions a pump is essential, since it is the only means by which water can be brought to the surface without exposing the contents of the well to contamination. It is likewise of the first importance to have the walls of the well curbed to a sufficient depth to prevent the possibility of seepage from the surface. It is, of course, also quite necessary that the well be of sufficient

depth—the lower we go the more likely are we to secure a perfectly pure water. In regions where the water rises to within eight or ten feet, or less, of the surface, the possibility of the well being contaminated during the rainy season by seepage is considerably increased, and the waters of such wells should be used only after analyses have shown that they are pure; where this cannot be done, the water should be boiled before being drunk. Of course, the possibilities of contamination are greatly increased if the locality be thickly inhabited.

As has been before remarked, cisterns are more liable to contamination from the air than are wells, chiefly owing to the fact that they are supplied by water that is conducted into them by gutters from the tops of houses. There is no question that during the dry seasons dust containing many kinds of bacteria is deposited all over the tops of houses and remains there until washed away by the rains. While it is true that the sunlight quickly kills most germs that produce disease a certain number of them would inevitably escape, and having gained en-

trance to a cistern, would be likely to multiply and later cause trouble. It is thus seen that however pure the rain-water may originally have been—and it is among the purest of all waters—it is likely to become contaminated in the process of collection, and may ultimately in this way become the source of disease. Where any doubt exists as to the purity of such water it should be boiled before use.

Surface-streams also occasionally supply drinking-water in rural districts, and while the use of such waters may not always be attended by danger, their contamination by disease-producing germs is much more to be feared than when they are derived from wells or springs; where streams arise from and keep their course through uninhabited districts the probabilities are strong that their waters are pure and fit for use, but where they run through cultivated fields, and particularly where they pass in the neighborhood of houses, their waters should never be looked upon as being drinkable,—except after being boiled or properly filtered. Inasmuch as adequate filtration is exceedingly difficult to carry out, and requires a somewhat

extensive and costly plant, this is, as a rule, not feasible for the dweller in country districts, and boiling, therefore, remains the only satisfactory method of rendering the water fit for use where doubt exists as to its purity.

Location of Pens and Stables for Animals.— Animals should always be housed at some little distance from the dwelling. While it is true that man does not often contract directly diseases from hogs, sheep, horses and cattle, there are some maladies of a most serious character that come to us in this way, and we should, therefore, always guard against their occurrence by removing ourselves as far as is possible from sources of possible infection. The matter also has an æsthetic side, as odors of a disagreeable character may prove very annoying where animals are kept too close to the house. It is likewise of importance that stables should be, if possible, on lower ground than the dwelling, since during rains materials from their dung may be washed around and under the house, and may possibly gain access to the well.

Every care should be taken to keep hog-pens

and stables clean, since otherwise very foul smells are engendered that oftentimes find their way to neighboring houses. There is also a suspicion that some of the germs that produce disease find the conditions suitable for their stables and pig-sties.

In this connection it might be well to warn those unacquainted with the subject against the *all too common practice* of close association with dogs, since it is well established that in addition to hydrophobia they may transmit, while apparently in perfect health, maladies of a deadly character to the human being. It cannot be too often emphasized that the less intimate our association with the lower animals is, the greater the likelihood of our escaping many serious diseases.

CHAPTER IV

HYGIENE OF INFANCY AND CHILDHOOD

No characteristic of the Caucasian mind is more marked, and none more universally affects his actions than a constant, gnawing suspicion that the things going on around him are not being done in the proper way, and consequently an irrepressible desire to experiment, and if possible, to change everything. Such a spirit is unquestionably the basis of what we call progress, and, in so far as it conduces to the health and happiness of mankind, is entitled to our most hearty commendation. On the other hand, it cannot be denied that too often we endeavor to bring about changes with but an imperfect understanding of the basic principles at issue, and naturally, under such circumstances, our efforts are crowned with anything but success. In other words, an enlightened investigation of the whys and wherefores of any

existing state of affairs may and often does, lead to improvement, while, on the other hand, ignorant meddling is likely to be followed by disastrous consequences.

Nowhere do we see the bad results of false conceptions more marked than in our treatment of infants and children.

Particularly do young infants suffer in this way, as they are pounced upon as soon as they enter the world by every old "granny" and negro "mammy" in the neighborhood, and plied with abominable concoctions that would be productive of homicide if we were to attempt forcibly to administer them to grown men, and whose only effect on the defenseless little sufferer is to cause colic and indigestion. Many times has the writer seen a wee, tiny little mortal, who was too young and weak to even protest, bundled up with a mountain of flannels in the hottest weather of July and August. True to the superstition that the warmer we kept an infant the better, too frequently we see them confined to hot stuffy rooms when they should be out in the sunshine, or under the trees. Instead of being allowed to gain health and strength in the forests, which are the schoolhouses of nature, the miserable little wretch is later sent to a public school as soon as he or she can be trusted to go alone on the streets, and the tiny victim too frequently contracts diphtheria, scarlet fever, whooping-cough, measles, or some other disease as a reward of

merit. Truly we see to it that the helpless innocents early realize the truth of the melancholy and hopeless biblical lament that "man's days here are few and full of trouble."

We should rear our children with as little interference as possible, allowing them the utmost freedom compatible with their safety, and permitting them to do those things that nature and instinct demand. Above all let them sleep as much and as long as they will, insist that they live in the open air, and encourage them in every possible way to perfect their physical education by those active amusements that they instinctively prefer. After they have established a sound and rugged constitution ample time will be left for them to develop mentally.

Feeding of Nursing Infants.—The most important thing in connection with the feeding of infants is to always remember that nature has provided in their mother's milk, when sufficiently abundant and normal in quality, everything in the way of food and drink that they require. During the three days that usually intervene between birth and the coming of the milk in the mother's breast, infants may be

given from time to time small quantities of pure water, but under no circumstances should anything else be allowed. During this period the child may be put to the breast four or five times in the twenty-four hours, for, while it gets but little in the way of nourishment, there is even at this time a watery fluid secreted in the breast that goes far towards supplying everything that the infant needs for the time being.

A child should never nurse longer than twenty minutes at one time. It is likewise of importance that the time of nursing be strictly regulated.

Particularly during the first year it is of the utmost importance to watch with an intelligent eye the growth and development of the child. Where the milk agrees with it it has a good color and gains regularly in weight; it cries but little, and is good natured, and thoroughly contented. Should it, on the other hand, lose weight, appear fretful and listless, and sleep badly, there is something wrong, and the mother should at once have her milk examined by a competent physician.

In case the mother does not give sufficient nourishment there is no objection to partially feeding the infant on modified cow's milk—the method of the preparation of which will be considered later on.

Where colic occurs it generally means that the infant is getting a diet too rich in albuminous foods, which should be corrected by advising the mother to take an abundance of outdoor exercise, and to avoid all causes of worry so far as is possible.

Vomiting freely is a very common occurrence in small children, and is usually the result of too much food being taken at a time. It also occurs, particularly some time after feeding, as a result of indigestion, which is frequently the consequence of the milk being too rich in fats. Wherever an infant shows signs of trouble it is well to advise the mother to use a diet less rich in meats, and to caution her against over-eating.

Children should be weaned at the end of their first year. This had best be brought about gradually, by, in the beginning, feeding the child once daily, and then gradually increasing

the frequency, at the same time proportionately leaving off the nursing. Where children are not thriving, it is often a good practice to wean earlier, in which case modified cow's milk, taken from a bottle, must be substituted.

Artificial Feeding.—While it is true that children often thrive for a time on the various baby-foods with which the market is so abundantly supplied, it is, nevertheless, the case that where fed in this way they are very apt to develop rickets or scurvy, and not uncommonly show evidences of bad nutrition in loss of weight and strength, becoming peevish and fretful, and sleeping badly.

Much better than any of the artificial foods is properly modified cow's milk, which, with care, may be prepared in such a manner as to take the place of mother's milk in the vast majority of instances. In order, however, that this be successfully carried out, much care and attention is necessary.

At this point it is well to stress the fact that the mother's milk differs from that of the cow in some quite important particulars, and it is only by intel-

ligently taking these differences into consideration that it is possible for us to prepare an artificial food that will be satisfactory. Principal among these differences are that cow's milk contains three times as much albuminous material as that of the human being, and that it is less rich by about half in milk-sugar; furthermore, the former is acid in reaction, while the latter is neutral, or faintly alkaline. It will be seen, then, that in order to prepare a modified cow's milk that will approximate that of the human being it is necessary to dilute it with water sufficiently to cause the albumen to approach in proportion that of mother's milk, and at the same time some alkali must be added to neutralize the excessive acidity. Modified milk prepared, however, from the whole cow's milk, would contain much less fat than is desirable, so that we must use in making it the upper third of the whole milk after it has been allowed to remain undisturbed for a number of hours; in other words, in making modified cow's milk we use a large proportion of the cream, with a less amount of the other constituents.

The following table for calculating the proper proportion of milk to be used at the various periods of the infant's life may be recommended, as it gives quite as satisfactory results as those that are more elaborate; it also gives the frequency of feeding and the proper amounts that should be used. The table was devised by Dr. C. E. Boynton, of Atlanta, Georgia.

	Fat percentage desired.	Quantity ounces at feeding.	No. of feedings in 24 hours.	Intervals by day.
Premature	1.00	¼– ¾	12–18	1–1½ hrs.
1–4 day	1.00	1 –1½	6–10	2–4 "
5–7 "	1.50	1 –2	10	2 "
2–week	2.00	2 –2½	10	2 "
3– "	2.50	2 –2½	10	2 "
4–8 "	3.00	2½–4	9	2½ "
2–month	3.00	3 –5	8	2½ "
4– "	3.50	3½–5½	7	3 "
5– "	3.50	4 –6	7	3 "
6–10 month	4.00	5 –8	6	3 "
11–month	4.00	6 –9	5	4 "
12– "	4.00	7 –9	5	4 "
13– "	4.00	7 –10	5	4 "

In making calculations from this table it is assumed that the milk from the upper third of the bottle, after it has been allowed to sit for at least four hours, contains 10% of fat, and this is therefore called 10% milk. The calculation is made as follows:—10% milk is to the fat percentage desired, as the amount which we wish to make up is to X. For example, if we wish to prepare twenty ounces of milk for an infant two months old, we will note by referring to the table that 3% is the amount of fat that is desirable for a milk for a child of this age, and the formula will be constructed as follows:—

$$10 : 3 :: 20 : X. \quad X = {}^{60}/_{10}. \quad X = 6.$$

Six ounces is then the amount of 10% milk that must be used for making twenty ounces of modified

milk,—this being mixed with one ounce of lime-water and thirteen ounces of boiled water. It should never be forgotten that while milk modified by the foregoing formula is suitable for most children, it is by no means always satisfactory, and we may, therefore, be compelled to do a considerable amount of experimenting in some cases before arriving at the correct formula.

Suppose the infant is twelve months old, we would get according to the rules just stated the following equation:—

$$10:4::20:X. \quad X=\tfrac{80}{10}. \quad X=8.$$

Eight ounces would then be the amount of milk required for preparing twenty ounces of modified milk for an infant of this age.

In preparing modified milk according to the formulas just given, it must be remembered that in all instances only that portion is to be used which collects in the upper third of a bottle of milk that has been allowed to sit undisturbed in a refrigerator for at least four hours. The lime-water is for the purpose of correcting the acidity of the milk.

It is of much importance to select the milk from a healthy cow in all instances where it is to be fed to infants, and where possible, it should be examined by a competent laboratory man in order to determine if it answers the proper requirements. The writer has often seen milk from apparently healthy cows, which seemed in every way good, that showed on microscopic examination pus cells and a harmful germ (streptococcus).

It is not desirable to have a milk for this purpose that is too rich in fats, and for this reason a cow of the ordinary mixed breed is more satisfactory than the blooded Jerseys or Alderneys.

Not only is it essential to get the proper kind of milk, but the utmost care is necessary in handling it. It should, of course, be as free as possible from every source of contamination, and should be strained thoroughly as soon as milked. It should then be bottled, and chilled at once by being placed in cold water, and after being properly sealed, should be placed in a refrigerator at a temperature of about 50° F., where it should remain undisturbed for four hours before the top portion is skimmed off for making the modified milk.

After the modified milk has been prepared it should be returned to the refrigerator, where it should be kept until required for feeding. It is best not to use milk that has been in the refrigerator longer than twenty-four hours, or at most forty-eight hours, and then only if kept at a proper temperature. The modified milk should be poured directly from the receptacle in which it is kept into the feeding-bottle, and the latter should then be placed in warm water until its content is milk-warm, at which time it is ready to be given to the child.

It is highly necessary in feeding infants by the bottle to remember that cleanliness in everything connected with the process only

makes success possible, and in no particular does this apply with greater force than in connection with the proper care of the bottle and nipple. In every case immediately after use they should both be put in water, which should then be brought to a boiling temperature, and both should then be kept in a saturated solution of boracic acid. The nipple, after being placed on the bottle, should not come in contact with anything but the infant's mouth. Bottles that have no neck are much to be preferred to others, as they can be readily cleansed. There is on the market at the present time a bottle called the "Hygeia," which possesses the necessary qualifications in a perfectly satisfactory way.

When children who have nursed at the mother's breast reach the age of weaning it is of importance to remember that they cannot eat without digestive disturbances the modified cow's milk of a strength that would otherwise correspond to their age; they should invariably under such circumstances begin with a milk prepared by the formula used for a child several months younger, after which the pro-

portion of milk may be gradually increased until it is used in a pure state.

During very warm weather it is well to reduce the amount of fat by using the whole milk instead of the top portions, as heretofore described. The same precaution should be followed where children have acute diseases, and the total quantity taken should be less than under ordinary circumstances. Where infants have acute indigestion, accompanied by vomiting and diarrhœa, all milk should be for the time withheld,—boiled water being substituted; some hours later barley water may be given, but no milk for at least twenty-four hours. Where children have loss of appetite, it is well to give less cream, and the intervals between food should be increased.

Sterilized (*Pasteurized*) *Milk.*—During epidemics of dysentery, diarrhœa, typhoid fever, scarlet fever, and diphtheria, as well as in those instances where it is suspected that the cow is not healthy, or where the milk has to be kept for considerable periods of time, it is well to sterilize it by heating. The most effective method of accomplishing this is by boiling the

milk for an hour or so, but inasmuch as it is believed to be then not quite so wholesome as when less heat is employed, a process known as *pasteurization* is frequently used; this consists in heating the milk for thirty minutes to from 155° to 160° F.,—such temperatures killing all of the ordinary germs, but not altering the milk so completely as when it is boiled.

Peptonized Milk.—It now and then happens that children fail to thrive where all of the precautions heretofore referred to have been strictly adhered to, and under such circumstances good results are frequently secured by subjecting the milk to a process known as *peptonization.* This consists in the addition of a digestive ferment, obtained from the pancreas of lower animals, together with ordinary cooking-soda. In carrying out the process the milk, whether whole or modified, is placed in a clean bottle, and the peptonizing powder added after having been rubbed up with a teaspoonful of milk. The container is then placed in a pitcher of water at a temperature of 110° F., which is about as warm as the hand can bear comfortably, and is here left for from ten to twenty

minutes if only partial peptonization is desired, or for a couple of hours should it be wished to complete the process. The peptonized milk may be prepared at each feeding, or the whole amount for the day may be made at one time in the morning; in the latter case, where it is desired to have the milk only partially peptonized, the ferment should be destroyed by boiling after it has been allowed to act for from ten to twenty minutes.

Feeding after the First Year.—As the infant is weaned other food should be gradually added; this should still consist largely of milk, to which some time later may be added gruels prepared from well-cooked oats or barley, beef-juice, or the white of an egg slightly cooked. The various broths may also be allowed. Children relish very much all fruit-juices, and they may be given in moderation without harm, and even with benefit in many cases. As the child grows older, the various cereals should form a greater and greater proportion of its diet, but due care should be exercised in always seeing to it that they are thoroughly cooked;

in order to be digestible for children such substances should be cooked at least three or four hours before eaten.

General Hygiene of Infant Life.—In order for children to be healthy, the greatest regularity is necessary in their habits. They should arise at a certain hour in the morning and go to bed at a fixed time at night. Their clothing should be loose, and not too tight fitting, and should at all times correspond to the state of the weather. Nothing is more common, and nothing produces irritability, loss of sleep, and even serious general disturbances in infants, more frequently than too much clothing. It is generally customary to use from the time of birth and during the period of infancy a flannel band around the child's abdomen. Just how this acts is not clear, but there seems good reason for the belief that in some unexplained way the practice has the effect of warding off intestinal disturbances, and is, therefore, to be recommended.

Napkins should be changed when soiled, and then should be immediately placed in water,

in which they should remain until washed out; under no circumstances should they be left lying around the nursery.

When the weather permits, the child should be kept as much out-of-doors as is possible. For the first few days of the infant's life, particularly if the weather be cool, it should, of course, be kept indoors, but even then free access of air should be allowed. There is no objection whatever to the infant sleeping out-of-doors—in fact, where this is feasible, it generally shows improvement as soon as the practice is commenced. When out-of-doors, it is of course necessary to see that the sun does not shine directly into the infant's face, and wetting should, of course, be avoided; also the hood of the carriage should be arranged to prevent strong winds from blowing on the child.

The nursery should be well aired, a window being left up at night except during severe weather.

Sleep.—Nothing is more important for the proper development of a child than for it to have an abundance of sleep. During the first few months of its life it sleeps practically all of

the time—the period becoming gradually lessened as it grows older. Infants should be suffered to sleep just as much as is possible, it being not only unjustifiable but absolutely criminal to interfere with them in this particular in the slightest degree. Not only is it necessary that infants have all the sleep that they desire, but it is true throughout childhood, a fact to which many foolish parents seem utterly oblivious. How often do we see a child scarcely more than an infant aroused in the morning and sent off to school, and how frequently do we hear misguided parents boast of their inflexible rules in enforcing such evil practices. Truly man comes hard by the knowledge that nature is much wiser than he, and the vast majority never learn the fact at all.

As soon as the child is able to crawl, it should be placed on a clean quilt or blanket on the floor, and allowed to move about to its heart's content. When it is able to walk, allow it to run about and play to its full capacity—as in such exercises consists the great school of its physical being, the school upon which will de-

pend its strength and health in after life. Allow the child to keep up his play as long as he has any inclination to do so, and never be so foolish as to confine him in the house when he wishes to be out under the blue heavens, for here only will it be possible for him or her to develop into a real man or woman. Allow this to go on until the child of its own accord comes and asks to be taught other things, for not until then is its outside education nearing completion, and not until then is it possible for him to take interest in and learn things connected with books. No boy should ever be sent to school before he is twelve or fourteen years of age; girls, on account of their maturing earlier, may begin a couple of years sooner.

The whole science and art of properly raising children consists in feeding them good clean food in proper amounts, in never allowing them to be awakened, and in permitting them to play in the open air to their hearts' content.

Teething.—Teething is a subject which has at all times interested both doctor and layman,

and in its supposed relation to all kinds of disorders of infancy has undoubtedly exercised an influence over the popular imagination out of all proportion to its real importance. Too often it has happened that this perfectly normal, and usually by no means serious, process, has been held responsible for grave diseases in children—diseases which in reality were the consequence of neglect and mismanagement in the far more serious matters of food, sleep, out-of-door exercises, and general hygiene. It cannot, however, be denied—particularly in respect to nervous children—that teething appears occasionally to induce unpleasant disturbances, such as fretfulness, broken sleep, digestive disorders, and occasionally fever; as a rule such symptoms persist only for a few days, if the infant be properly looked after. The treatment should consist in lancing the gums should they become much swollen, and the withholding of the usual amount of food, particularly where intestinal disturbances occur. The ages at which the teeth usually come are as follows:

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2 Middle Lower Teeth.....	5 to 9 months.
4 Upper Front Teeth.....	8 to 12 months.
Remaining Lower Front Teeth.	12 to 18 months.
4 Front Jaw Teeth.....	12 to 18 months.
Stomach Teeth (Canine).....	18 to 24 months.
Eye Teeth (Canine).....	18 to 24 months.
4 Back Jaw Teeth	24 to 30 months.

Bowel Diseases.—Digestive disturbances, accompanied by diarrhœa, are the bane of infancy, and are responsible for a very large part of the frightful mortality among babies. The subject, therefore, is one of tremendous importance, but is so complicated that the limits of this little volume will only permit its being touched upon.

As already mentioned, indigestion accompanied by looseness of the bowels may be and often is the result of milk being used from diseased cows, or it may be the consequence of such carelessness in handling it that disease-producing bacteria are later allowed to contaminate it. It should also never be forgotten that where children are eating artificially prepared food improper mixing of the different components may result in serious disturbances, and we should, therefore, exercise the utmost care al-

ways in seeing to it that the food is prepared strictly according to the table which has already been given—not forgetting that in a certain number of instances we can go by no rule, and will have to experiment until we ascertain the proper proportion of the ingredients.

After a diarrhœa begins we should at once reduce the quantity of fat in the milk that is being given to the infant, and if the trouble be at all severe it is best to take it off of all food for twenty-four hours, and substitute boiled water or barley-water. As soon as the trouble is checked we may then begin to feed cautiously with largely diluted milk, and, gradually increasing its strength, in the course of a few days return to the food that was being given before the disturbance occurred. A dose of calomel or castor oil in the beginning of diarrhœal troubles often has a very salutary effect; the parent should not hesitate to administer this if a doctor is not at hand.

In warm climates during the time of teething children very commonly develop chronic diarrhœal conditions which often end fatally; wherever possible the parent should under such

circumstances at once remove the little sufferer to a colder climate where recovery is generally rapid and complete. Even the most careful nursing under the most competent physician is often fruitless in combatting disorders of this character as long as the infant remains in a warm climate.

Colic.—Colic is always due to indigestion, and is the result of the food undergoing fermentative changes, with the production of gases. This goes on even under normal conditions to a certain extent, but when it is excessive the intestines become greatly distended, and pain of a severe or even agonizing character is produced.

In the treatment of this condition warm applications should be made to the abdomen, and as quickly as possible an enema (injection), consisting of a few ounces of warm solution of salt water should be given; the salt should be in the proportion of a level teaspoonful to the quart of water. Parents will find the little ear syringe, which may be purchased at any drug store, a most satisfactory instrument for giving enemas to infants, as they do not hold

too much, and being soft, are incapable of tearing the delicate tissues of the child. It is of the utmost importance to remember that the salt solution should be tepid, yet not sufficiently hot to scald the infant. As the water when given in this way is expelled very quickly the enemas may be repeated any number of times desired.

Where these measures fail, a physician should be sent for at once, but in the meantime if it be evident that the infant is suffering very much, a small dose of paregoric may be given; it should not however be forgotten that opiates are exceedingly hurtful to nervous children, and that soothing syrups and other mixtures containing drugs of this class should be avoided.

Constipation.—Constipation among very young children generally passes off as the food becomes richer, but should it occur at a later time, the trouble may be more difficult to remedy. Of first importance is having the bowels of the infant move at a certain time each day, which may be quickly accomplished in many little children by placing them upon a small chamber daily at a given hour; usually the

baby very quickly learns what this procedure means, and in this way a regular habit is established which is of the utmost value to the child throughout its infancy, and every effort, therefore, should be made to bring it about as quickly as possible.

The addition of malted milk or Mellin's Food may also have the effect of diminishing constipation;—the result being brought about by the maltose contained in these preparations. The same thing may be accomplished by substituting for a part of the milk sugar in the baby's food a similar quantity of maltose. Milk of magnesia may be used in preparing the baby's food in the place of lime-water, with the result oftentimes of relieving a tendency to constipation.

Croup.—By croup is meant a spasmodic condition which usually affects children at night, and is in no way to be confounded with that really dangerous disease, membraneous croup, or diphtheria, to which so many children fall victims.

Spasmodic croup is a condition which has as its basis digestive disturbances, and is almost

always relieved as soon as the stomach is emptied. Vomiting may be brought about by making the child swallow a small quantity of mustard stirred up in water, or by the use of ipecac. Such severe and extremely unpleasant remedies are rarely necessary, however, since the disease may be in almost all instances at once relieved by placing around the victim's throat a cloth wrung out of cold water, which may itself be covered by a dry bandage to prevent the bed from getting wet. Children will usually go to sleep in a few minutes after the cold cloth is applied, and suffer no ill consequences as a result of its remaining around their throats throughout the night. Where the croup is very severe the little sufferer's feet may be placed in hot water, in addition to the cold cloth around the neck—the combination practically always resulting in the rapid relief of the unpleasant symptoms.

Great care should be exercised in the diet of children who are subject to croup, as by intelligent supervision the tendency to this very annoying trouble may be in a short time entirely overcome.

Nervousness.—Children of neurotic parents, particularly where they are reared in cities, are exceedingly prone to nervousness in one form or another. The condition is undoubtedly often due to heredity, but may be induced in otherwise healthy children by unhygienic surroundings and improper food. Infants exhibiting symptoms that indicate trouble of this kind should not be played with, and every care should be exercised to so direct their lives that the trouble may be gradually overcome. In all cases where nervousness persists an intelligent physician should be consulted.

Vaccination.—The only safe method that we possess of preventing small-pox is by means of vaccination. Its great value has been so thoroughly tested that the writer does not deem it necessary to go into a discussion as to its merits. A child should be vaccinated in at least three places during its early infancy,—there being no danger in doing the operation immediately after birth. Persons ignorant of aseptic surgery should not do this operation, but should always call in the services of some person prepared to do the work in a cleanly

manner. Either the leg or the arm may be selected; and children should be revaccinated whenever small-pox breaks out in the community.

Kissing Babies to be Avoided.—Kissing infants in the mouth is a very bad practice, as in this way disease may be quite innocently conveyed to them. The public should be taught to understand that it is not infrequently the case that bacteria may be present in the mouths of individuals who are quite immune to their ill effects, and who are, therefore, perfectly well, but who may, by conveying them to others, particularly children, induce in them serious disease. When caressed in this way at all children should be kissed upon their necks or feet, and never in their mouths or on their hands.

Juvenile Contagious Diseases.—Children are peculiarly prone to a class of highly contagious diseases, the exact nature of which is not yet understood, and we possess therefore little knowledge as to the proper means of preventing their spread. Practically all that is known about them is that they are conveyed by contact, or even by the air, particularly where a

child suffering from one of them is placed in a confined place with another who is susceptible; these diseases likewise may be carried by means of clothing and other articles that have been in close contact with a child suffering with any of them. The lesson of importance to be learned, therefore, is that if we wish our children to escape maladies of this class we should not permit their indiscriminate association with others. As these diseases cease to be a serious menace after children have passed through their earlier years it does not at a later time matter so much as to whether they are exposed to them or not. As a general thing children develop these affections in from ten to fifteen days after having been exposed, though one of the most severe of them, scarlet fever, may make its appearance as early as twenty-four hours after it is contracted. These diseases are usually ushered in by a severe headache, pains in the head, back, and limbs, high fever, and oftentimes a chill. As soon as a child develops such symptoms the advice of a competent medical man should be at once sought, and

the little sufferer should be at once completely isolated.

In concluding, the writer would particularly exhort parents to obey to the letter the instructions of their physicians, and never under any circumstances to dose their helpless offspring with patent or proprietary medicines, which contain no man knows what, and which unquestionably are often highly injurious, especially to children.

CHAPTER V

PROPER EATING—THE SECRET OF GOOD HEALTH

VERY slowly the world is awakening to the fact that no agencies play such an important part in the preservation of health as the consumption of reasonable quantities of well-cooked and properly selected food, and the habitual taking of wholesome drinks. On all sides the observant medical man sees constant and reckless disregard of the simplest and most fundamental laws governing this subject. Nothing is more common than to hear of men in the prime of life being seized with what is called a "nervous breakdown,"—which generally means a digestive breakdown—to be followed by an era of misery for the unfortunate subject and his scarcely happier family. Nervous and irritable, the slightest inconveniences are magnified into terrible calamities, he constantly fears death, and his sleepless nights be-

come a saturnalia of gloomy thoughts and abject fears.

Of course, not everyone guilty of dietetic sins goes through such sad experiences, for the naturally strong frequently escape the consequences of their rashness, particularly where they live in the rural districts and take plenty of out-door exercise. Let not such, however, flatter themselves that their disregard of hygienic laws will go unpunished. After indiscretions in eating they will all, at one time or another, have acute indigestion with diarrhœa; and how often does the previously well and hearty man after indiscretion in eating wake up with a dull headache, furred tongue, foul breath, and a general feeling of sluggishness and mental depression?

Is it his liver? Our unscientific medical ancestors—at a loss to account for the state of affairs in any other way—answered in the affirmative, and, believing it was produced by a collection of bile in the liver, called the condition "biliousness." How absurd modern science has shown this assumption to be! We now know that the liver is rarely diseased, and

that it furnishes its secretion, called bile, for the purpose of aiding digestion rather than hindering it, and that this substance is rarely, if ever, produced in excess. It is undigested, putrefying food in the intestinal tract that produces the trouble. Under such circumstances one usually takes a dose of calomel, which, being pehaps the most satisfactory and perfect purgative that we possess, relieves the condition promptly by getting rid of the offending material; but the drug does not act on the liver.

Unfortunately ill results of quite a different and a much more serious character often follow in the wake of dietetic errors; in those who have a tendency to consumption, particularly where they overwork, this dread disease frequently makes its appearance as a consequence of bad eating and drinking. Many, if not all, of the degenerative diseases that appear in the latter half of life are produced in this way, and nothing is more certain than that the peace, happiness and longevity of mankind could be incalculably increased by the simple observance of what is known concerning proper eating and drinking.

We will now consider the very important subject of the quantity and character of foods which should be taken in health, with suggestions as to those most suitable for dyspeptics.

Over-eating too Prevalent.—The majority of us take much more food than is necessary, with the result that we suffer from indigestion.

When we consume more than a reasonable amount of food habitually serious digestive disturbances are sure to result,—to be often followed at a later time by tuberculosis, morbid alterations in the blood-vessels, Bright's disease, and other serious maladies of a chronic nature. Professor Chittenden, who is America's greatest physiological chemist, has demonstrated that in all probability previous workers along these lines have been excessive in their estimates as to the amount of food required. He showed that a man could live for a period of nine months on a daily ration which contained about one-third of the usual amount of proteids generally thought to be necessary, and at the same time the fats and carbohydrates were reduced to such a degree that the total number of heat units, or calories, liberated from the food

scarcely exceeded in number one-half of the standard requirements. He also experimented on thirteen volunteers from the hospital corps of the United States Army, to whom he daily fed rations of only 2,000 calories, and, notwithstanding that they engaged in physical work, all were found to be in better condition at the end of six months than they were at the beginning.

These results strongly point to the conclusion that previous estimates as to the quantity of food required are erroneous, and that man can not only live, but may continue in strength and health on much smaller amounts. It is highly probable that this discrepancy may be accounted for, at least to a considerable extent, by the assumption that much of the food ordinarily taken is rejected by the system, and passes out as waste, while, when small quantities are eaten, it is for the most part absorbed.

Mastication.—Thorough chewing of the food is absolutely essential for proper digestion. While it is true that this, like all other good things in life, may be, and often is, carried to an unnecessary extreme, it is certainly true that we would be infinitely better off if we were to go to

the extent in this direction of so called "Fletcherism" rather than perform this most important function in an indifferent manner.

This rule applies with especial force to food of a starchy nature,—bread, potatoes, oatmeal, rice, etc. In order to digest food of this character it must be very thoroughly cooked and when finally placed upon the table it should be of such consistence that it requires chewing before it can be swallowed. Not only is this necessary from the standpoint of breaking up the larger particles into smaller ones, thus permitting the food to pass freely through the stomach and intestine, but it is of the greatest importance for it to be thoroughly soaked with the saliva during the process. It is thus of no advantage for starches to be served in a finely divided form—in fact it is directly the contrary, since under such circumstances it is almost always the case that such foods are swallowed without having been insalivated.

What has been said concerning the mastication of starches applies with almost equal force to other foods. Without exception their digestibility is much increased by thorough

chewing. As the result of recent experiments carried out by means of the X-ray, it has been shown that particles of food of any considerable size will not pass from the stomach into the intestine; as often as an object of this kind attempts to force its way from the former into the latter the opening between the two closes, and as a consequence the food is retained in the stomach longer than it is in health—resulting in the course of time in catarrhal conditions of the organ just named, and an unnatural relaxation of its muscular walls. Under such circumstances the patient quickly develops symptoms of indigestion, and if his habits be not corrected the trouble gradually grows worse until the sufferer becomes a chronic dyspeptic.

Classes of Nutritive Substances.—All substances that are of any appreciable value in nutrition may be divided into those that are nitrogenous in character (albumins, legumins), the carbohydrates (starches and sugars) and compound ethers (fats). Of all these the nitrogenous foods are the most important, since they contain the material from which the

great bulk of the body is largely composed, and at the same time there is every evidence that in case of need they may be broken up into chemical substances that may take the place of any of the other kinds of foods; upon nitrogenous food, then, a man may live alone, while this cannot be done on other articles of diet. The fats, starches and sugars are very closely related to each other, and it is generally believed that they subserve much the same end in the economy; by undergoing chemical change they furnish energy (heat and muscular force) and are undoubtedly largely responsible for the formation of the fats of the body. While there is some evidence that under certain conditions alcohol may be a food, its value is certainly very small, and it is not of sufficient importance to be considered in this connection. The ideal diet then for a healthy man is a proper proportion of nitrogenous (albuminous) food, along with a reasonable portion of fats, starches and sugars. Professors Voight and Atwater have calculated the following table, which fairly represents the amount of proteids, fats and carbo-

hydrates that should compose the rations for twenty-four hours for the ordinary adult male.

ADULT MALE OF AVERAGE WEIGHT.

	At Rest.	Moderate Labor.	Severe Labor.
Proteids	110 grammes	118 grammes	145 grammes.
Fats	50 "	50 "	100 "
Carbohydrates.	450 "	500 "	500 "

The tables that follow, which were arranged by Hutchinson, give a very good idea of the generally accepted views as to the relative quantities of the different foods that are thought necessary for the average adult engaged in ordinary muscular work:—

Food Materials.	Amount.	Albumins.	Fats.	Starches.	Fuel Value.
1.	Ozs.	Lbs.	Lbs.	Lbs.	Calories.
Beef, round st'k..	13	0.14	0.12	....	695
Butter	3	....	0.16	....	680
Potatoes	6	0.02	....	0.15	320
Bread	22	0.12	0.02	0.75	1760
Totals	44	0.28	0.30	0.90	3455
2.					
Pork, salt	4	....	0.21	....	880
Butter	2	....	0.11	....	450
Beans	16	0.23	0.02	0.59	1615
Bread	8	0.04	0.01	0.28	640
Totals	30	0.27	0.35	0.87	3585

Food Materials.	Amount.	Albumins.	Fats.	Starches.	Fuel Value.
3.	Ozs.	Lbs.	Lbs.	Lbs.	Calories.
Beef, neck	10	0.10	0.09	....	550
Butter	1	....	0.05	....	225
Milk, one pint....	16	0.04	0.04	0.05	325
Potatoes	16	0.02	....	0.15	320
Oatmeal	4	0.04	0.02	0.17	460
Bread	16	0.09	0.02	0.56	1280
Sugar	3	....	....	0.19	345
Totals	66	0.29	0.22	1.12	3505
4.					
Beef, up. sh'lder..	10	0.09	0.13	....	800
Ham	6	0.06	0.13	....	650
Eggs, two.....	3	0.03	0.02	....	135
Butter	2	....	0.11	....	450
Milk, one pint....	16	0.04	0.04	0.05	325
Potatoes	12	0.01	....	0.11	240
Flour	9	0.05	0.01	0.38	825
Sugar	1	....	....	0.06	115
Totals	59	0.28	0.44	0.60	3540
5.					
Sausage	4	0.03	0.11	....	510
Codfish	14	0.07	....	....	140
Butter	2	....	0.11	....	450
Milk, one pint....	16	0.04	0.04	0.05	325
Beans	5	0.01	....	0.13	505
Rice	2	0.01	....	0.10	205
Potatoes	16	0.01	....	0.23	420
Bread	9	0.04	0.01	0.28	640
Sugar	3	....	....	0.19	345
Totals	71	0.27	0.28	1.03	3540

Food Materials. 6.	Amount. Ozs.	Albumins. Lbs.	Fats. Lbs.	Starches. Lbs.	Fuel Value. Calories.
Beef	8	0.08	0.10	....	560
Mackerel, salt ...	4	0.04	0.04	....	230
Eggs, two	3	0.03	0.02	....	135
Butter	2-½	....	0.13	....	565
Cheese	1	0.02	0.02	....	130
Milk, one pint...	16	0.04	0.04	0.05	325
Potatoes	8	0.01	....	0.08	160
Rice	2	0.01	....	0.10	205
Bread	9	0.05	0.01	0.32	720
Sugar	1-½	....	....	0.09	175
Totals	55	0.28	0.36	0.64	3205

Calories Defined.—It should be explained that the term "calorie" is one which has been adopted as a scientific expression for the fuel-value of substances undergoing oxidation, and in this connection refers to the heat-producing capacity of foods. The "calorie" is the amount of heat required to raise the temperature of one gramme of water 1° C. It has been estimated that starches, sugars and albumins liberate during combustion 4.1 calories per gramme, while fats produce 9.3 calories. It will be noted that in the tables just given the total number of calories is in each instance somewhere in the neighborhood of 3,500, which

is considered to be about the number of heat units required by the average man at moderate muscular work. The weight of the average woman being less than that of the adult male, a reduction of about 20 per cent. from the foregoing figures would approximate the amount of food required by the former.

CHAPTER VI

BREAD AND ITS RELATIONS

At all times, and among all peoples, bread has been recognized as one of the great staple articles of diet. Although its commonly quoted designation, "the staff of life," would more appropriately belong to the albumins, there can be no question that breads of one kind or another are among the most wholesome and necessary of all food-substances. Not alone is this true on account of the starch of which they are largely composed, but they contain more or less vegetable albumin; it is thus seen that bread is a mixture of the two most important food-stuffs, starch and albumin, but the quantity of the latter is so small that an individual would have to eat an enormous amount of the mixture to secure enough of this ingredient to meet the needs of the body. For practical purposes, then, we may regard bread as being starch.

Within recent years quacks have disseminated very widely throughout this country the error that foods are more digestible when raw. It was long age demonstrated that pure albumens, of which eggs and milk are the nearest natural examples among foods, are assimilated somewhat better when eaten raw, but this applies to no other foods except sugars. Any success that has followed the teachings just referred to undoubtedly rests purely on the fact that their followers are instructed to live largely on raw eggs and milk, and as the patient usually discovers in a short time that these two foods agree with him while other uncooked ones do not, he naturally eats them to the exclusion of the rest and where he takes a sufficient quantity increases in weight and strength.

The idea that starches are more digestible when eaten raw could be easily refuted by any intelligent farm-boy who recalls one or more sad experiences from over-indulgence in raw sweet potatoes.

What shall we look upon as bread? Of course all such food-stuffs as are commonly included within this designation are to be accepted; such as wheat-bread, graham-bread, whole-wheat bread, biscuits, rolls, light bread, bakers' bread, waffles and batter-cakes, rye bread, corn bread, preparations of corn-starch, with which we should place those articles of diet so commonly used in the south, usually called grits, hominy,

egg-bread, muffins, corn-meal cakes, potatoes, both sweet and Irish, arrowroot and the so-called cereals or breakfast-foods, including oat-meal.

Now which of these is the most wholesome? This inquiry cannot be answered conclusively for the reason that the digestibility of this, as of other foods, depends largely on the individual. For the sake of clearness the various breads will now be considered in detail.

Wheat-bread the Best.—It may be confidently asserted that well-cooked and perfectly dry wheat-breads are to be regarded as being generally the most digestible of all bread-stuffs. This is not dependent on any inherent property in wheaten starch as a result of which it is acted upon more readily by the juices whose office it is to render it fit for absorption in the body, but is wholly due to the fact that breads of wheat-flour may be made very dry and light.

As has been already explained, it is particularly necessary that starches should be thoroughly soaked in saliva, and this can only be accomplished when the bread is of such consistence that it must be chewed for a time, and

so dry that it will readily absorb the salivary secretion. The writer, then, would advocate well cooked light-bread or bakers' bread, or toast made from either, as being the best of all food-stuffs of this character. The crusts of biscuit a day or so old are quite digestible, as are also waffles, if made with little grease and cooked thoroughly. The soft inner portion of biscuit and that of hot rolls, as well as batter-cakes, is decidedly unwholesome.

Graham-bread should not be constantly indulged in for the reason that it contains multitudes of sharp particles of the husk of the grain that cut the delicate mucous membrane of the stomach and intestines as it passes along, and if its use be long and continued, severe ill effects necessarily follow.

In this connection attention should also be called to the common error that particles of husk are of advantage to breads of all sorts; the former consist chemically of exactly the same thing as sand, and are quite as indigestible, and this, in connection with what has just been said of their action on the delicate mucous membranes of the intestinal tract, should be quite enough to convince anyone that they are not only useless, but injurious. It is true that the

irritation produced by the husk will oftentimes cause the bowels to act, but results of the same character may be induced by many other agencies, within themselves less harmful.

Rye-bread.—There is no reason why rye-bread should not be prepared in quite as wholesome a way as is wheaten-bread, and this grain should undoubtedly rank as one of the best of the cereals. Its use, however, is so limited in this country that it is scarcely necessary to go into a lengthy discussion as to its merits. It may be remarked that the ergot fungus frequently grows on this grain, and when ground up with it occasionally poisons the consumer where the quantity of the substance is large and the bread is eaten in considerable quantities. Instances of this kind are not uncommon among the peasantry of Europe, where a black bread made from rye is the staple article of diet. Of course, when making food-preparations of rye, we should be careful to have the flour thoroughly winnowed, and to cook the bread until sufficiently dry to acquire a proper consistency for chewing.

Corn-bread and Corn Food-products.—When

made from perfectly sound grain, and if not allowed to undergo fermentative changes afterward, there can be no question that food-products of corn are entirely wholesome, and, from the standpoint of chemical composition, quite as nourishing as similar articles of diet prepared from other grains. It is, however, unfortunately true that we cannot, in the majority of instances, definitely assure ourselves that our corn-bread is made from grain that comes up to the above specification, nor can we be sure that the meal is fresh, or preserved at such a temperature as would forbid the growth of various germs. It has long been known that bad corn would kill horses, but notwithstanding this, we have accepted the view that no amount of deterioration in the grain could result harmfully to man. That this latter assumption is incorrect seems now in the highest degree probable.

Pellagra.—It is known that a very curious and fatal disease called pellagra is prevalent to a considerable degree at the present time in the United States, and it is not going too far to say that all of those best capable of judging are of the opinion that

the malady is the result of eating just such corn as we know kills horses.

It is likewise true that the nutritive power of this grain could in no way be increased by allowing it to decay before consumption; indeed, the contrary must be the case, and, if it were in no manner actually harmful, our sense of the æsthetic and of what is proper to eat, should make us reject in this case, as with other foods, that which is unsightly to the eye and unpleasant to the taste. We should no more eat bad grain than a rotten apple, or putrefying meat. The increased prevalence of pellagra is exciting attention all over the United States, and is very generally assumed to be the result of lack of care in the harvesting and preservation of our corn. Instead of being cut before it is ripe, and shocked in the field during the latter part of the summer, it should be allowed to ripen on the stalk, and after cold weather sets in gathered while dry, and preserved in well-covered and well-ventilated barns. Every care should be taken to keep it dry while being shipped from one part of the country to another, and similar precaution should be observed with the various food-products made from it. If kept in a cold place, meal or grits made of good corn may be preserved in excellent condition for eating throughout the winter; but as soon as the warm weather begins they should be stored in the refrigerator, and should there remain during the summer; similar precaution should be taken with meal or other corn-products during the hot months.

Over a large area of the United States corn-bread is an article of daily diet with a great majority of the inhabitants, and its wholesomeness as compared with other breads becomes, therefore, an important question. Unfortunately, corn-meal does not lend itself to the preparation of a dry bread having sufficient consistency to require chewing. It is true that the crusts of the bread made from this grain answer these requirements fairly well, and there is therefore no reason why this part of it should not be used to any extent, provided it be prepared from good meal. We should endeavor to cook thin pones of the bread rather than the thicker ones so common in the south. The objection that corn-bread can only be masticated with difficulty applies to the other preparations of this cereal, such as egg-bread, muffins, etc., and they are not, therefore, with the exception of the crusts, to be looked upon as being the best form of bread. Corn-cakes, like all batter-bread, are to be mentioned only to be condemned. Grits and hominy are soft and moist and cannot be properly chewed, and are, therefore, not to be recommended as good breads.

Corn-starch preparations are likewise entirely lacking in the elements required to make good bread, and should only be used occasionally and in small amounts.

Disadvantages of Potatoes.—Irish potatoes are eaten almost as commonly in some portions of the United States as are corn-products in others, and therefore deserve the careful consideration of the hygienist. While it is not believed that, like the latter, potatoes give rise to any definite disease, it is unfortunately true that they are theoretically worse breads than those made from the grain just referred to. In whatever way cooked, they are moist and require no chewing, and as a consequence many persons with delicate digestions do not assimilate them properly.

Arrowroot.—The preparations of arrowroot are considered digestible, though here again we find that such articles of diet are generally moist and of not proper consistence to be chewed, and they are, therefore, not as valuable as are breads made from wheaten flour.

Rice.—Rice is used by a large portion of the world's inhabitants. When cooked thoroughly

and very dry, it is perhaps almost as good bread as is that made from wheat. The starch granules of the former, like those of arrowroot, are somewhat smaller than those of wheat.

If it were possible to keep rice-flour in good condition, and if it could be made into light-bread, it is likely that it would be superior to wheaten flour, but this does not appear feasible.

A peculiar and very fatal disease prevails in the East, known as "kak-ke" or "beri-beri," which is now generally regarded as being the result of eating decomposed rice. The writer has seen one or two examples of what he considers American beri-beri, but as our rice-eating population is small, it is not likely that this disease will ever become a serious problem in the United States.

Cereals or Breakfast-foods.—Lastly we will consider the so-called breakfast-foods, which are neither more nor less than various preparations of the different varieties of starch. They are generally made from oats or corn-starch. They are nothing more than bread, and as some of them have been put through a sort of fermentation it is difficult to understand how they

could be regarded as being quite as wholesome as the original products from which they were made. This, however, is not the principal objection to them. The real trouble lies in the fact that they are, in the majority of instances, served with cream and sugar. When we remember what has already been said about starches that are soft and cannot be chewed, and of the ill effects of sweets on persons who have any inclination towards dyspepsia, it will be seen that these foods are not to be regarded as being wholesome. The real reason that would appear to explain the coming into existence of these preparations is that they are mixed with cream and sugar, which appeals strongly to the "sweet-tooth" of the average person. They are nothing but bread, and very bad bread at that. The remarks made concerning breakfast-foods apply with equal force to oat-meal, which, as generally used, has the additional disadvantage of containing particles of husk.

In concluding this discussion on starchy foods the writer desires particularly to call attention to a very common error in the way they are eaten. Mention has already been made of the

fact that fats after being melted are by no means so wholesome as in their natural state, and produce, when heated with starches, a very indigestible mixture. Thus, theoretically, it is bad to use any great amount of lard, butter or other fat in the preparation of breads, and it is likewise undesirable to spread butter on heated breads, as is so often done just before eating biscuits, waffles and batter-cakes. The combination is certainly a seductive one, and pleasing to the taste of most persons, but this in no way invalidates the fact that the mixture is exceedingly indigestible.

Pastries and Cakes.—Peculiarly unwholesome are pastries containing any considerable proportion of fat, and also most varieties of cake. With the exception possibly of hot batter-cakes served with an abundance of butter and syrup, cooks have so far produced no compound so heinous and totally depraved as pound-cake. Fruit-cake also stands high up in the list of undesirable sweets. It certainly passes all understanding why cooks should continue to persecute the stomachs of a dependent world with such highly obnoxious concoctions; the only ex-

cuse that can be given for them is that the mixtures are palatable. Where a housekeeper feels it necessary to prepare cake, she should select some receipt free from butter or other fat, such as angel-cake or sponge-cake, both of which when properly made are exceedingly good to the taste, and lack the undesirable quality of containing fats. Explanation for the peculiarly unwholesome character of food containing melted grease lies probably in the fact that the grains of starch under such circumstances must be to a greater or less extent covered by a thin layer of the fatty substances, and as a consequence it is impossible for the saliva to penetrate to the starch and perform its normal digestive function.

CHAPTER VII

MEATS, SUGARS AND MILK

First in the list of foods the writer would place those nitrogenous substances commonly eaten that belong to the class of albumins. That these substances are in reality the most important of all food-stuffs there can be no sort of question, since they, of all things eaten by the human being, are alone absolutely essential for his well being and even his existence. They are the substances that almost exclusively go to make up the muscle and tendons. Along with the lime-salts they enter largely into the composition of the bones and cartilages, brain, spinal cord and nerves. Other foods are incapable of taking the place of the albumins, so that they are absolutely essential for normal life in the human being.

The amount of albumin necessary for the normal adult has been variously estimated, the tendency at the present time being to place the

quantity needed somewhat lower than was at one time done. It is probable that about two ounces of pure albumins is somewhere near the amount required in twenty-four hours by a normal adult.

It is well, since we are so dependent on foods of this class, that we have two quite distinct sources from which they may be taken. The great bulk comes to us in the form of meats, including poultry, game, oysters and fish of various kinds, in addition to beef, mutton, and hog-meat in its several forms. Of animal origin also we have eggs, which are among the most valuable of all foods of this class on account of their high digestibility.

From the vegetable world we get albumins known as legumins, which differ somewhat from those obtained from animal sources, though taking their place in the economy in all essential particulars. Unfortunately the legumins are usually so mixed with starches and other vegetable substances less digestible, that it is necessary to take a large bulk of foods of this latter class in order to secure anything like the requisite amount of the former.

Before taking up individually the various albuminous foods, the writer would again direct attention to the chapter on cooking, and would strongly urge upon the reader the proper methods of preparing nitrogenous foods therein stated. Where the albumins are in a nearly pure state, as in milk and eggs, they are slightly more digestible when raw, but all meats should be cooked until only the faintest tinge of red remains if we wish to have them prepared in the most wholesome way for those with delicate digestions. Meats are, as a rule, most wholesome when cooked "very done."

It has long been the cry of sentimentalists that no living being should die in order that man might exist. Unfortunately for such theories, the stern and unbending edict of nature has negatived views of this kind ages before the altruistic philosopher came on the scene, and we are daily constrained to bow to this mandate of one of the primal laws of existence. However much we might desire it otherwise, it has been written that "only in death is there life," nor may any animal being disobey and continue to exist. As has been already explained, the human being cannot thrive on vegetable substances alone; from them he may get a certain amount of nitrogen in the form of legumin, but there is not

enough to make up for the waste of this substance that constantly goes on in the body.

Theoretically it is of very little importance which of the meats are selected to supply our nitrogenous food, but it is unfortunately true that such foods vary much in digestibility, and it will therefore be necessary to consider them separately.

Beef.—When tender and cooked to a proper degree, beef is considered one of our most wholesome of meats. Like other foods of this kind, it should not be fried, but should be broiled or roasted, and a certain amount of fat may be eaten along with the lean portions without injury, and in many persons unquestionably with benefit.

Mutton.—Of all the coarser meats, mutton is unquestionably the most digestible, and when cooked in the same way as directed for beef is eminently wholesome.

Hog-meats.—On account of the large portion of fat between the muscle-fibers, hog-meat, particularly when fresh, is not usually regarded as being digestible. Some persons eat it with impunity, but for the vast majority it should be

taken only in small quantities. It should not be fried. In the form of ham, hog meat is more wholesome than when fresh, but even in this condition many dyspeptics find much difficulty in digesting it. The best method of cooking it is to boil thoroughly. After being cooked in this way and then broiled, it is most appetizing, and is much more wholesome than when broiled without being previously cooked. As bacon, hog-meat enters largely into the dietary of a great portion of the laborers of this country, and there can be no doubt that on the whole it answers the purpose of a staple food admirably. It contains even more fat than nitrogenous substances, and may therefore be looked upon as a mixture of butter and meat. Dyspeptics cannot eat it with impunity in many instances, though it agrees far better with them than does ham or the fresh meat. If it were generally eaten boiled it would provoke less trouble than when fried. At this point the writer would repeat his warning concerning the indigestible character of melted grease, of which the gravy from bacon is a striking example.

When "cured" in a somewhat different way

hog-meat as "breakfast-bacon" is very generally used throughout the civilized world, and is one of its most wholesome forms. This when broiled is both appetizing and wholesome, and should form a part of the daily dietary of everyone able to afford it.

Poultry and Game.—Among the more delicate and most wholesome forms in which albumins are taken we find poultry and game well up toward the head of the list. Meats of this character should be very thoroughly cooked by being either baked, smothered or broiled.

Fish.—Fish of almost all kinds are wholesome provided they be fresh and properly cooked. The culinary artist prepares of them most appetizing and nutritious dishes, and they are therefore properly to be recommended as among the best of the albuminous foods.

Oysters and Clams.—Oysters and clams are usually considered somewhat apart from the generality of the foods of this character. When fresh they are wholesome and delicious when eaten raw, and may be cooked in a great variety of ways. The reader should be especially warned that fried oysters are not so wholesome

as when they are prepared by other methods, for the reason that they are surrounded by a batter containing quantities of melted grease.

Eggs.—Among the most delicate, digestible, and nutritious of all foods we may place eggs. Though somewhat more digestible when raw, they agree, as a rule, even with the most fastidious stomach, however cooked, even when hard-boiled. Eggs lend themselves readily to the formation of many delicious dishes, such as omelets, soufflés, etc.; but unfortunately they do not contain nutriment in a very concentrated form, and where an adult is living on them alone it requires from one and a half to two dozen daily to furnish the necessary amount of food.

Fats.—Under the term "fats" are included all oily substances, such as butter, lard, olive and cotton-seed oils, and to a great extent the fat contained in meats. These substances are closely related to starches and sugars, and undoubtedly play a more or less similar rôle when taken into the body as food. From the standpoint of heat-producing capacity they more than double, weight for weight, meats and starches,

and are, therefore, instinctively highly prized by dwellers in cold countries where much heat is necessary. In warmer countries the necessity for excessive heat-production in the body does not exist.

While oily substances are certainly capable of adding to the cushion of fat commonly found beneath the skin in normal individuals, they are not looked upon as being to any extent tissue-builders, resembling in this particular the starches and sugars.

When fats are to be eaten, care should be taken that they be as fresh as possible, or, if this is not feasible, they should be preserved in such a way as to prevent their becoming rancid—a condition which is the result of the formation of fatty acids, lending a peculiarly unpleasant odor and taste, and producing a decided decrease in food-value. This alteration may be largely prevented by keeping fats in a refrigerator at a low temperature, and may also be greatly retarded by the addition of salt. In this country butter is usually treated with a very considerable amount of salt, but in Europe it is universally served fresh. Within recent years facts have been established that show that Americans use an excessive amount of this substance—possibly causing disease in some cases; and doubtless we would be better off if we were to follow the European practice.

Oily substances when in good condition are certainly of high value as foods, but should be taken

more or less with an eye to the climate, and to the season of the year. When placed on cold bread and eaten along with it they are extremely palatable, and may be taken in reasonable amounts with decided benefit to the whole body. In temperate climates it is generally estimated that about three ounces is a desirable amount for the average adult. In this connection it may not be out of place to mention that the various preparations of cod-liver oil, advertised so freely in the lay press, in some instances actually do not contain a single particle of the substance that they are supposed to be principally composed of; and it may be further stated that there is no good reason to believe that bulk for bulk oils of this kind are in any way superior to those fats commonly eaten. The writer often recalls the saying of a very wise old physician of his acquaintance that "cod-liver oil is nearly as good as butter."

Sugars.—This term includes the large number of different substances of a more or less sweetish taste that belong to the group of carbohydrates. They are closely related to the starches, and it is generally assumed that they play much the same part after being taken into the body. Some of these are of animal and some of vegetable origin—but except the sugar found in milk, the only ones commonly consumed are those derived from cane, beets,

and fruits; the sugar from the first two is known as cane sugar or dextrose, and that from the latter as grape sugar or glucose. Like albumins they may be eaten without having been previously cooked, and are unique in that they undergo no chemical change whatever as a result of ordinary degrees of heat.

While the consumption of sugars in all civilized nations is rapidly increasing, there can be no question that, irrespective of fruits, they are, of all foods, the most frequent causes of digestive disturbances. It is only within comparatively recent times that mankind has possessed means of separating sugars in any great bulk from the plants containing them, and as a consequence they have only entered prominently into our every-day diet for a relatively short period of time. Before this, it is true, they were consumed to a greater or less extent in various fruits, but the quantity was insignificant as compared with the amount now universally eaten. As a result of this we are now confronted with a new dietetic problem. For ages the human stomach has been accustomed to deal with only small quantities of these sub-

stances, and developed accordingly a capacity to digest them proportionate to the amounts then eaten. Now, however, we constantly call upon our digestive organs to deal with large quantities of such foods, and it is not strange that there has been more or less rebellion on their part.

Experiments have shown that a small amount of sugar assists in the normal chemical changes that go on in the body, and it is, therefore, obvious that nature intends us to take a certain quantity of it. Moreover it is true that sugars while being burned in the body give off much energy—mainly manifested in muscular power; where then we are taking active physical exercise foods of this kind are peculiarly appropriate. It would, therefore, not be wise for us to leave this food entirely out of the dietetic list, but to use it only in small amounts—particularly where we lead sedentary lives. Sugar and alcohol play a more or less similar rôle in the animal economy. It is well known that those who do not use alcohol are peculiarly prone to consume considerable quantities of sugar; and it is equally a matter of common observation that those who habitually take alcohol rarely eat sweets to any extent.

When sugar is properly assimilated, as seems to be done most easily by children, it is an excellent food, but where sweets are over-eaten, and not properly digested, they give rise to a great accumulation

of gas in the intestine, and produce in many persons a marked acidity of the stomach, frequently accompanied by severe insomnia. Nothing so quickly relieves such sleeplessness, caused by a "sour stomach," as allowing ten or fifteen grains of ordinary cooking-soda to slowly dissolve in the mouth and swallowing the saliva rendered alkaline in this way.

Milk.—Milk may be looked upon as an ideal food, it being composed of water carrying in solution the three great natural foods—albumins in the form of casein, carbohydrates as milk-sugar or lactose, and fat. Mixed in the proportion in which they here occur, they are most admirably adapted to the delicate digestive apparatus of the infant—the relative proportion of the different substances even gradually changing as the assimilative powers of the youthful organism increase; it is thus seen that milk itself is not of constant composition, even in the same animal, and that it alters in such a manner as to meet best the needs of the delicate being depending upon it for proper sustenance. It is also the case that the composition of milk varies in different animals—showing again how admirably nature exerts its powers in meeting desired ends.

The lesson of practicable importance that we learn from this is that the milk of one of the lower animals is not in its natural state quite suited to the delicate stomach of the growing infant, and that if it be substituted for the mother's milk it must be more or less altered, depending upon the age of the child. It is particularly important that sweet milk be taken slowly, as otherwise large curds, difficult of digestion, form as soon as it gets into the stomach.

CHAPTER VIII

FOOD-VALUE OF VEGETABLES

In recent times we hear much of vegetarianism, which has its advocates among many highly intelligent people, and which, as a consequence, has achieved a certain vogue throughout the civilized world. It is rarely the case, however, that those who affect to practice this cult in reality live exclusively on a vegetable diet. As a rule it will be found that they are milk-drinkers, and not infrequently add eggs to their dietary. It is, of course, absurd to regard as vegetarians those who simply avoid meat, since it is true that the nitrogenous substances contained in milk and eggs differ in no essential particular from similar substances found in flesh of all kinds.

Experiments on a somewhat extended scale have shown within recent years that young and vigorous individuals at least may live and thrive on a diet composed largely of vegetables;

no one has yet shown that a strict vegetable diet is that best adapted to the average individual, and no competent authority on this subject at the present time advocates a diet purely of this kind. It is true that the vegetables ordinarily eaten contain all of the elements that are essential to the animal system, such as starch, sugar, fat and albumins. Unfortunately, however, the amount of the last-named substance is usually so small in food-plants that the quantity that would have to be eaten by a normal individual taking active exercise would cost considerably more than if a reasonable proportion of animal food were included, and —which is of even greater importance—the digestive powers of the individual who attempted to live only on food of this character would be severely taxed, and, in the long run, probably seriously impaired. Furthermore, vegetables and fruits contain substances, usually in great quantity, that are scarcely acted upon at all by the digestive juices. Chief among the latter is cellulose, which, while forming the great bulk of the food of herbivorous animals, is scarcely suited to the weaker digestive capacity

of the human being; practically none of it is converted to the uses of the body. It is thus seen that in the average man or woman a dietary consisting largely of vegetables would result in the presence in the intestines of a greater or less bulk of indigestible materials, which could subserve no good purpose other than that they would by their mechanical presence have a tendency to cause the bowels to act; as is the case with fruits, however, it is unfortunately true that this large residue of undigested food, in one way or another, often gives rise to considerable irritation of the mucous membrane of the intestine, and frequently produces dyspeptic disturbances, among which looseness of the bowels is common.

This brings us to a consideration of the digestibility of vegetables in general, which is always the paramount consideration when dealing with the value of any substance to be used as a food. It has been before remarked that young and vigorous persons seem to thrive on a dietary largely of vegetable character, but the case is certainly quite different with older people, particularly where their digestive powers

are impaired. In the latter we often find that severe intestinal disturbances follow even after moderate indulgence in vegetable foods—particularly where they are served with vinegar, or some other fruit acid. Another peculiarity of foods of this kind that makes decidedly against their digestibility lies in the fact that, being soft and containing a large proportion of water, they are scarcely ever properly chewed, and as a consequence they are swallowed in comparatively large masses without having been adequately insalivated.

Vegetables may be roughly classified as legumes, roots and tubers, and green vegetables, and will now be considered briefly in the order named.

Legumes,—Beans, Peas, Lentils, and Peanuts.—With the exception of the cereals, the legumes are the most valuable of all vegetable foods. Their nutritious properties are mainly due to their relatively high percentage of nitrogenous material, though they also contain starch and fat. Hence these vegetables contain the ingredients necessary to supply all the needs of the human economy; unfortunately, however,

when eaten alone in sufficient bulk to furnish the nourishment required, they often—even in healthy individuals—give rise after a little time to dyspeptic disturbances.

Of beans, a large number of different varieties are in common use including string-beans (or snap-beans), lima-beans, kidney-beans, red beans, the frijole, and the Soya bean. String-beans are exceedingly palatable, and are very much prized as an article of diet by the peoples of all countries. When gathered young and thoroughly cooked while still fresh they are exceedingly wholesome, and are very well assimilated, when properly chewed, by even those whose digestions are considerably impaired. The other beans named are generally eaten dry after having been removed from the pod in which they grow. When they are soaked in water until they become soft and then thoroughly cooked they make an excellent food, and, when not taken in too great quantities, are fairly digestible. When cooked with onions, parsley, and red pepper in proper proportions they make a very delicious dish. In Japan the Soya bean forms the basis for a kind of vege-

table cheese which is eaten with rice, and furnishes the nitrogenous materials in which the latter is deficient. Peas are wholesome when young and fresh and when properly cooked, and as they come on in the early spring when other fresh vegetables cannot be obtained, they furnish a most acceptable addition to the dietary. When old, after their skins become tough, they cease to be digestible, and should not be eaten except in the form of purees, during the preparation of which the hull is removed.

Lentils are scarcely eaten at all in America, but are much prized in some portions of the Old World, as the basis of soups.

Peanuts belong to the group of legumes, though, unlike the others that serve as food, they grow beneath the surface of the ground. They are highly nutritious, but are, unfortunately, indigestible, owing largely to the high percentage of oil that they contain. The latter is extracted, and is sometimes sold as olive-oil; in a somewhat different form it is made into a sort of butter which is quite palatable.

Roots, Tubers, and Yams.—Sweet and Irish potatoes, which constitute the most important

members of this group, have already been discussed under the head of breads. Of those that remain, some few, as beets and artichokes, may be regarded as related to those just referred to, while others, such as carrots, turnips, radishes, parsnips, etc., are generally reckoned among the succulent tubers on account of the large proportion of juice that they contain. Irrespective of the beet, which furnishes a considerable portion of the sugar of commerce, none of them may be looked upon as foods of a very important character, as they contain only relatively small proportions of sugars, starches, and nitrogenous materials. Beets, however, do contain a very high percentage of that which makes potatoes so popular,—about eighty-five per cent. of starches and sugars, with only a trifle of nitrogenous material. When young and tender they are often eaten as a salad, either alone or mixed with other vegetables, and are generally regarded as being wholesome and highly nutritious. They should not be eaten by dyspeptics when pickled, on account of the vinegar.

Artichokes are occasionally eaten, but are not

nutritious, although they agree well with many persons.

Carrots, when young and fresh, are fairly digestible, but like other vegetables are exceedingly apt, particularly if old, to produce intestinal disturbances in dyspeptics. They are not very commonly eaten in the United States, but where selected with care we would profit by their more frequent use. They contain a small percentage of starches, with an insignificant proportion of vegetable albumen.

Turnips are exceedingly unwholesome, contain very little nourishment, and may be eaten with impunity only by persons in vigorous health. The same remarks apply to radishes, and to parsnips.

Green Vegetables.—Vegetables of this class are of much more value from the standpoint of their agreeable taste, and the consequent stimulating effect upon the appetite, than from the nutritive materials that they contain. Some of them are eaten cooked, while others are usually consumed in a raw state. They are all much less indigestible if eaten when quite young and

fresh—drying seemingly having the effect of producing alterations in them that predispose to dyspeptic disturbances in those so inclined.

Spinach is one of the most digestible of the entire group, and is much eaten in all parts of the world.

Turnip-tops differ in no essential particular from spinach. They have a somewhat bitter taste, but when young and fresh are highly palatable, and if thoroughly cooked cause comparatively little intestinal trouble, but like spinach they contain practically no nourishment. The same may be said of the leaves of various other plants commonly served as greens, among them beet-tops, and dandelion-tops.

Cabbages, many different kinds of which are habitually eaten as food in civilized countries, have comparatively little nutritive value, and are, generally speaking, decidedly indigestible, although young and vigorous persons, particularly where they take abundant out-door exercise, find no difficulty in assimilating the inner portions of the fresh cabbage "head." As in the case with other vegetables, the soil and lo-

cality in which the cabbage is grown largely influences its taste, and to some extent its digestibility. It should never be given to infants. Sauerkraut is a preparation of cabbage leaves produced by adding salt, and later crushing them with considerable pressure; after a time alterations occur of a fermentative character, and the product is generally regarded as more wholesome than fresh cabbage.

Cauliflower consists of masses of the somewhat modified flowers of a plant closely related to the cabbage, and is, when properly prepared, palatable, and perhaps somewhat more digestible than cabbage. Cole, and Brussels sprouts, are plants of the cabbage family, and are perhaps even more indigestible.

Salad Plants.—The leaves of the lettuce are usually eaten raw, most commonly being served as a salad in combination with oil and vinegar, or lemon juice. That the leaves possess, when treated in this way, a very palatable taste all will perhaps agree, but they cannot be said to be of any nutritive value, nor are the acids just referred to conducive to their digestibility.

On account of their somewhat pungent taste, watercresses are used in many parts of the world as ingredients of salads, but they are, of all vegetables, the ones that are most liable to transmit disease to man, for in addition to the possibility of contracting in this way typhoid fever, dysentery, cholera, and the ordinary intestinal worms, the human being is apt to receive with them the eggs of the flukes, and the spores of the amœbæ that produce chronic tropical dysentery. As they are probably never grown under such conditions as to preclude the possibility of this danger, it would be the part of wisdom to absolutely refrain from their use.

Onions, Leeks, Shellots, and Garlic.—Vegetables of this group are eaten either raw or cooked, and of all those consumed in the former state are least liable to transmit disease, owing to the fact that they are nearly always thoroughly peeled before being eaten. They have the advantage, furthermore, that they may be preserved for long periods of time in such a way as to be fit for food, and when properly cooked have a delicate flavor, and are quite wholesome although furnishing little food for the body.

Garlic is never eaten as a vegetable, but serves as the basis for many of the delicate sauces for which the French cooks are so justly celebrated.

The tomato has been used as a food only within comparatively recent times, it having been formerly thought to be poisonous. Like the onion it may be eaten either raw or cooked, and if taken in moderation does not, as a rule, produce any serious harm. When eaten in greater quantities, both on account of the acid that it contains and its relatively small proportion of assimilable nutriment, the tomato is exceedingly prone to cause intestinal disturbances, and should rather be regarded as a fruit than a vegetable. Growing at some distance from the ground, it is rather less apt to convey diseases than the majority of vegetables eaten in a raw state.

While celery is generally eaten raw, it furnishes a palatable dish when cooked in milk. It should not be eaten by dyspeptics or children, particularly if raw. Similarly the cucumber has a well-merited reputation for producing dyspeptic disturbances. It is only eaten raw, is frequently served as a salad, and should be used

only when very young and fresh, and eaten only by persons of sound digestion.

Okra is much prized in the Southern States as the principal ingredient of a very palatable soup, but is not as a rule looked upon with favor by the uninitiated. It is also much eaten boiled and served with a little butter and pepper. When fresh and young it is fairly digestible, and furnishes a very agreeable addition to the dinner.

In addition to those already referred to, there are a number of vegetables that are very popular either alone, or in combination as salads—particularly in the South; among them are green peppers, parsley, mint, capers, endive, and chicory. The remarks already made concerning green vegetables apply equally to these just mentioned, and it should here again be particularly insisted upon that salads containing acids are unwholesome for infants and children, and should be used sparingly even by those in health. None contains much nourishment.

Among easily digestible vegetables asparagus probably takes front rank, and in addition to this has the merit of being exceedingly agreeable to the taste. It possesses little nutritive value, but when young, fresh, and well cooked, it may be taken even by infants without harm.

Rhubarb, or "pie plant," is eaten stewed, and

made into pie. It is said to be somewhat laxative, and is decidedly more wholesome than many others. The squash, when properly cooked is comparatively wholesome, but contains little nourishment, and is of no particular value as a food, and the pumpkin is not much better, although useful during the winter for making pies after the ordinary vegetables and fruits are gone.

Cranberries, when thoroughly cooked and separated from the hulls, form the basis of a delicious jelly that is widely eaten in the winter over all portions of the United States. Like all sweets it is not entirely wholesome for dyspeptics or infants, but as it is usually eaten with meats and not in great quantities, it may be looked upon as being one of the most wholesome of all foods of this class. It does not seem to have such a tendency to produce sour stomach in many dyspeptics as is so frequently done by other foods containing vegetable acids.

CHAPTER IX

DANGER IN FRUITS AND PICKLES

It is an error shared almost universally by both medical men and the laity that fruits and raw foods are wholesome. Everyone is familiar with the fact that fruits produce intestinal disturbances in children,—not only when they are very young, but after their digestive apparatus is fully developed. Rather curiously, however, instead of ascribing the disturbances that follow to the real cause, we generally dismiss the matter with the assertion that "early fruits are unhealthy," or trace the resulting ill effects to some other equally imaginary factor. In reality the reason why diarrhœa and other intestinal troubles so often occur after eating fruits in the early spring is that the boy or girl after a winter's fast greedily devours enormous quantities of them when they first ripen, and disturbances follow in proportion to the amount and character of these substances taken.

There can be no question that fruits, while extremely palatable, usually produce trouble in dyspeptics, and even in those who still possess unimpaired digestive organs ill effects quite constantly follow on the heels of the taking of food of this character. Unfortunately, however, the great majority of dyspeptics have symptoms that in no way outwardly point toward digestive errors; as common examples, we might refer to the blackheads, pimples and small boils, so frequently observed on the faces of young boys and girls, or the rheumatic pains, and, at a later time, the "Bright's disease," that occur in older people. When you tell such patients that their trouble is indigestion, they are often mildly indignant, and loudly protest that they can eat anything with impunity; that they never have heart-burn, feelings of heaviness after eating, pains in the abdomen, or other symptoms referable to the stomach and intestines. We are rather disposed to be proud of our digestive powers, just as we are of our bodily strength, and nothing is more common than for chronic dyspeptics to maintain that they have never had indigestion in their lives,

and to resent any insinuation to the contrary.

Another popular error, almost universally accepted, is that fruits are highly nutritious; as a matter of fact they consist almost wholly of water, and of materials that are utterly indigestible. The latter substances pass through the alimentary tract, therefore, in much the same condition that they enter and serve no better purpose than to promote, somewhat, activity in the bowels. Nevertheless the writer does not wish to be misunderstood as advocating total abstinence from such a palatable class of foods; no harm results in most people if they only take perfectly ripe and fresh fruits in moderation now and then; and these should be always eaten after meals rather than before.

The fruits that contain comparatively little acid are, as a rule, more wholesome than those that are rich in substance of this kind. For example, perfectly fresh and ripe figs or peaches may be taken by most persons with impunity if they be eaten after meals, and at intervals of at least two or three days. Acid fruits, particularly lemons, seem to be peculiarly unwhole-

some; apples are prone to cause trouble and can rarely be eaten without ill effects, however mellow and palatable they may be. It sometimes happens that persons take grape-fruit with less harm than others.

Closely akin to fruits in their deleterious action on the digestive apparatus are sours in any form whatever. Women, especially, indulge freely and at irregular hours in foods containing much vinegar, lemon-juice, etc.,—usually in the form of pickles or salads. In healthy persons, in moderation, foods of this character perhaps produce no appreciable trouble, but nothing is more thoroughly established than that they act harmfully on the general run of dyspeptics, such as most of us are to a greater or less degree after thirty years of age. This leads to the remark that here, as in everything else, we must regard individual peculiarities—it being true that one person can eat without ill effects what may produce decided disturbances in others, or suffer from excess when moderation would entail no ill-effects.

CHAPTER X

DRINKS—PROPER AND HARMFUL

An immense amount of rubbish has been written during the last few decades concerning the supposed good effect of excessive water-drinking on the human economy. Something like a quarter of a century ago a London physician by the name of Haig brought forward and strenuously advocated the view that a large number of minor ailments were the result of the presence in the body of excessive quantities of uric acid; applying the well known fact that the substance just mentioned requires a large amount of water to dissolve it he conceived the idea that the proper remedy was to flood the body with enormous quantities of liquids, and thus, as it were, wash the offending substance out of the system. So plausible did he make this theory appear that it was accepted very largely by medical men, who in turn taught it to the general public. Within recent times it has been fortu-

nately shown that Haig's theory was wholly chimerical, and that quantities of uric acid greatly in excess of the normal amount could collect in the body, or might be injected into the blood-vessels, without the least harm resulting; thus, at one blow, this widely accepted theory was annihilated, and there now remains no sort of reason for attempting to remove uric acid by excessive water-drinking, or by other means.

It is fortunate that the uric-acid theory has been disproved, for the excessive use of water is not only unnecessary, but highly injurious to the digestive organs, particularly when the fluids are taken at or about meals. Experience has shown that excessive stomach-acidity, which is the most common form of indigestion, is in a large degree dependent on the taking of liquids while eating, and that even in those who are healthy any more than small quantities cannot be looked upon as being wholesome. In dyspeptics liquids seem to act in a hurtful way in several different directions. For example, where persons constantly take liquids while eating the necessity of properly chewing the food is largely done away with; in addition to this the mere presence of water in the stomach seems to tend to the production of increased acidity, for it has often been observed by the writer that even where food was eaten dry

indigestion would follow in many dyspeptics if they took water just before or immediately after eating.

The only sensible advice that can be given in this connection is that persons should take no more liquids that they feel a desire for, and they should avoid taking them in any quantity about meal time. What has just been said concerning water applies equally well to milk. When taken alone it very frequently agrees with patients much better than does solid food, but when mixed with the latter is prone to produce indigestion, just as does water. Fermented milk in the form of butter-milk is a very popular beverage in some parts of the world, but it may be well doubted as to whether it deserves the reputation for wholesomeness generally accorded it; being a liquid, and at the same time acid, it is peculiarly prone to increase acidity, and is not tolerated by persons who suffer with sour stomach. It should, however, be said that it, on the other hand, seems to agree particularly well with some people, and has been known when taken alone, at least temporarily, to relieve obstinate forms of indigestion.

Coffee.—The most universal beverage taken at meal time in America is undoubtedly coffee. Each morning countless thousands are cheered and stimulated by its invigorating properties to undertake their daily tasks, but, as is always the case after taking drugs that have such action the system has to pay the penalty in a reaction following later, during which the capacity for work is diminished. It is, however, true that the effect last referred to is not of such importance as to constitute in itself a serious objection to the use of coffee, but other ill results are rather prone to ensue that in many instances change the aspect of the question entirely. In a great many people, particularly after the first vigor of youth has passed, coffee produces anything but pleasant effects, and on some it seems to act as a downright poison. Like all liquids taken at meal time, it predisposes to acid indigestion, particularly when it is sweetened. It is likewise true that when it contains any considerable quantity of cream the liability to dyspeptic disturbances following its use are particularly great—doubtless as a result of the con-

siderable quantity of melted fats that it contains under such circumstances.

From the foregoing it appears then that coffee without either cream or sugar is less unwholesome than when these substances are added to it, but even when it is taken in this way it causes decided symptoms of indigestion in many persons. The writer is not of the opinion that the habitual taking of coffee is to be commended, and would, therefore, not advise its constant use; it, however, must be admitted—as is the case with all other substances that cause indigestion—that in many people, and particularly in those who live out-of-doors and are actively engaged in physical occupations, the use of coffee seems to result in no harm. Like other substances that cause indigestion in a concentrated form, coffee when largely diluted is less apt to produce disturbances of this kind; for example, a beverage consisting of two-thirds of hot skimmed milk and one-third coffee may be taken by many dyspeptics in reasonable amounts without any particular harm. Parents should be warned against allowing growing children to drink coffee; it seriously interferes with the normal chemical changes going on in their bodies, and is almost certain to be followed in later life by nervous dyspepsia.

Tea.—The stimulating principle of tea is chemically so nearly like that of coffee that they are generally considered as being one and the

same. That they differ decidedly in their action on the stomach and the body generally there can, however, be no doubt. The stimulating action of tea comes on more slowly than that of coffee, and is correspondingly prolonged. In most persons it is not so apt to produce nervousness, nor is its action in preventing sleep so pronounced. On the stomach it also produces effects that are diametrically opposed to those induced by coffee, since, instead of stimulating, it seems actually to retard the secretion of acids. It is, therefore, probably true that we should look upon tea as a beverage with much less disfavor than we do coffee—though, of course, it should always be remembered that there may be, and unquestionably are, many exceptions to this judgment.

Probably no other daily article of food or drink is so commonly prepared in an improper manner as tea—which is all the more curious when we consider that perhaps none other that requires heat for its preparation is so easily made. It should be brewed by simply pouring boiling water upon the leaves, but the vessel containing the decoction should not be placed over the fire while the tea is being prepared. Of even greater importance is the necessity of allowing the water to remain in contact with the

leaves only a few moments—*never more than a minute if we wish the tea to be good.* The reason for the latter precaution lies in the fact that tea-leaves contain a considerable amount of tannic acid, and, as the longer the water and leaves remain together the more of this substance is extracted from the latter, it is not difficult to see that we should be careful to allow only a brief contact between the two; the presence of this acid is undesirable, not only on account of the fact that it gives to the decoction a bitter and unpleasant taste, but because it has a tendency to cause digestive disturbances. It is seemingly not generally known that there are many varieties of tea, and that some of them are so superior in flavor and bouquet to others that they might well be entirely different substances. The best of all (in the writer's opinion) are those that are composed largely of leaves grown in Ceylon, usually mixed with India tea. If we will demand of our grocer a first-class Ceylon tea we will find that a beverage may be made from it that will appeal quite as much to the palate as a good coffee.

Before dismissing this subject finally, some reference should be made to ice-tea. This beverage is exceedingly palatable when properly prepared, and under such circumstances by no means deserves the disfavor with which it is regarded by many. The latter circumstance is entirely due to two things; first, we find too frequently that it is the habit of house-keepers to pour boiling water on the leaves when the midday meal is cooked and to allow them

to soak together until night, and second, the fact that lemon-juice is very commonly added to the tea before being drunk. The ice that the tea contains has little or nothing to do with the dyspeptic disturbances that frequently follow the drinking of cold tea. If we will leave out the lemon and pour off the water after it has been in contact with the tea leaves for something like a minute, it will be discovered that practically all of the ill effects usually ascribed to this palatable beverage have been done away with.

Alcohol.—A discussion of beverages would not be complete without some mention of those containing alcohol. This at once brings us face to face with the bitter controversy on this subject that has been waged so long throughout the United States, and which can only be considered here from the standpoint of the effects of alcohol on the human economy, and to draw corresponding conclusions.

That alcohol, even in very small quantities, reduces the general strength and capacity for work there can be no question, and in addition we find from experiments carefully conducted on the lower animals that the liability to infection by various disease-producing germs is greatly increased by the administration of even minute

amounts of the drug. A man then who is a habitual user of alcoholic drinks not only thereby diminishes his capacity to labor effectually, but at the same time renders himself more liable to disease. No more striking example of this could be brought forward than the well established fact that persons who use alcohol are exceedingly prone to consumption—so true is this, indeed, that we might almost look upon the drug as being practically the cause of this disease in most instances. Of course the bacillus of tuberculosis must be present in order for the malady to develop, but we find that the alcohol has prepared a soil for the growth of the germ which would not otherwise exist. This holds with equal force as regards other infectious diseases.

Again, it is true that maladies that result from bad digestion and improper assimilation are frequently produced by the habitual use of alcoholic liquors. Gout and Bright's disease are in the vast majority of cases the indirect offspring of habitual drinking. It should be noted —and the distinction is of importance—that the affections of a grave character most frequently

produced by the alcoholic habit do not ensue as a consequence of what could be rightly called intemperate taking of the drug,—its moderate use more commonly resulting in serious disease than when it is taken in great excess.

The explanation of this probably lies, at least in part, in the fact that the majority of drunkards only take alcohol at greater or less intervals, and as a consequence the system has time to recuperate between sprees. The typical dipsomaniac goes weeks, months, and even years without drinking at all, but when he is seized by the desire for drink he throws everything else aside and spends days and weeks in a prolonged debauch; during this period he eats very little, and as a consequence largely avoids the grave dyspeptic disturbances that would otherwise inevitably result. Alcoholics of this class acquire catarrhal conditions of their stomachs, and if seized with some acute disease, like pneumonia, during or just after a spree, quickly die in a large proportion of cases, but they do not develop gout or Bright's disease as a rule, nor do they very commonly become consumptive, as is the case with those who take the drug in small quantities day by day. Furthermore, it would appear that the grave disorders that so frequently follow the long-continued use of alcohol cannot be said to be the direct result of the use of the drug, but ensue as a consequence of the stimulating action of the alcohol on the appetite, leading to over-

eating. Under such circumstances indigestion follows from excessive over-feeding, and this is added to by the naturally irritating effect of the alcohol on the stomach. When this is continued through a series of years, the assimilating power of the organism gradually deteriorates, and we begin to meet with chronic dyspepsia, acute Bright's disease, and cirrhosis of the liver. Let no one then consider that he is not misusing alcohol for the reason that he only takes a drink before meals—it would be far better if he were to go on a moderate spree occasionally.

In this connection mention should be made of the great evil of patent medicines containing, and in reality essentially consisting, of alcohol. A vast number of them are widely sold under the misleading statement that they relieve catarrh, cure diseases of the kidneys, and that they act as tonics and general invigorants of the entire system. Masquerading under one guise or another they are sold to the unsuspecting public —prohibitionists for the most part—who fondly imagine that their glass of "bitters, "liver-regulator," or "safe cure for the kidneys," is entirely harmless. Let all such be warned that with scarcely an exception patent medicines of this class are nothing more nor less than poor

whisky containing some bitter to disguise the taste, and that they are in fact taking a drink when they use nostrums of this kind. The ultimate effect of this kind of drinking is to produce serious and grave diseases.

This discussion of the effect of alcohol on the human body would not be complete without calling attention to the extraordinary fact that those peoples to whom we owe our modern civilization have from time immemorial, most of all others, consumed the greatest amount of alcohol. Explain it as we may, the fact remains that the greatest achievements of the world were brought about by a society in which a very large proportion of its members were in the habit of more or less constantly taking alcoholic beverages. Naturally, the query is forced upon us whether this drug may not have played some important part in the great results achieved. Unfortunately, no one can answer one way or another, but our very ignorance should emphasize the importance of looking at the question from every side, and not jumping at conclusions before they are warranted by facts. It is true that most of our positive knowledge on this subject would

condemn alcohol as being the greatest curse of the ages, but it may be that it has played a beneficent part in the affairs of mankind through devious paths impossible to trace. Unquestionably a drug, the taking of which assists us in momentarily throwing our troubles aside, must be of a certain positive value to mankind. If only it possessed these good qualities with none of its bad ones!

Having considered very briefly the general effects of alcohol on the system a few remarks may be appropriately made concerning the several beverages commonly consumed in the United States for which it serves as a basis.

Whisky.—Under the term whisky will here be included all of those stronger alcoholic beverages that are the product of distillation. In addition to those commonly designated as such we may reckon brandy, gin, and rum, and at the same time those subtle combinations called mixed-drinks, for which they serve as a basis. It will, perhaps, startle the average reader when the statement is made that whisky and its near relatives just referred to, particularly when diluted by water, are by far the least harmful of

all alcoholic drinks. Their bad reputation lies in the fact that on account of their large percentage of alcohol they are usually preferred by drunkards, and that when consumed in excessive amounts by those unaccustomed to their use there often follow those frightful crimes with which these particular forms of alcohol are so odiously associated. The facts are, however, that when taken in moderation they are much less prone to produce indigestion than wines or malt liquors, and where one is determined to drink, they should unquestionably receive the preference. It should not be understood that the writer is in any way advocating their use, but the facts of experience compel him to state frankly that the least harmful of all alcoholic beverages is whisky, or its near relatives.

Wines.—There are a large number of fermented juices of fruits that are known as wines. They are either sweet or acid in taste, and both are peculiarly prone to induce dyspepsia in persons with delicate stomachs. Irrespective of their delicate flavor, which, in many instances, appeals strongly to the palate, the only

virtue that they may be said to possess is that they contain alcohol in small amounts; this, however, is off-set entirely by their large percentage of sugars and acids, causing them to be much more unwholesome than plain whisky.

Beers and Malt Liquors.—It is very fortunate that in those states of the American Union that have recently enacted prohibition laws, beer and other malt liquors are now being widely sold under the plea that they are non-intoxicating and that they are in no way unwholesome. While it is true that the former claim is in a measure correct, it is a fact well understood by those who have given the matter study that they are perhaps the most unwholesome of all alcoholic beverages. Those in the habit of using them are almost universally under the impression that they are harmless, and as the taste for them is easily cultivated, those who once acquire the habit are very apt to take them in greater or less quantities daily. As a result of this, chronic digestive disturbances are always sooner or later set up, and the victim in the course of time often acquires a gouty tendency, which is all the more danger-

ous for the reason that in America it scarcely ever manifests itself in acute joint inflammations. The patient gets into what has been called a "lithemic" state, which is but another name for gout, and sooner or later is exceedingly apt to develop a chronic form of Bright's disease. It is greatly to be deplored that some of our professional national school-masters do not address themselves to this subject rather than to appealing to the worst passions of the ignorant in attacking the great institutions of our country, and in assailing the fundamental principles of our government that come down to us as a priceless heritage from the wise and patriotic statesmen who first brought our nation into life.

In addition to the three great classes of alcoholic beverages already considered there are innumerable others, fortunately but little known to the general public, and prized only by connoisseurs in such matters. As we happily have no problem confronting us in any way similar to the absinth-habit, so common in France, it is not deemed necessary here to do more than merely to refer to them.

CHAPTER XI

IMPORTANCE OF GOOD COOKING

Reference has already been made to certain misconceptions concerning cooking diligently circulated in recent years by various quacks. The victim is advised that he must take large quantities of raw eggs and milk, and at the same time is instructed to eat a number of other specially prepared articles furnished at a stiff price and certified as being raw by the "medical company" furnishing the "treatment." Since it is quickly discovered by those who are entrapped by charlatans of this kind that the only raw foods that they can take with comfort and without disgust are milk and eggs, they naturally practically live on these alone, and as these foods are extremely digestible and nutritious, improvement in the patient's condition not uncommonly results.

Nevertheless, it is unquestionably true that the vast majority of foods are greatly improved

in digestibility, and are rendered much more palatable by thorough cooking. After being properly cooked there develop in foods certain flavors and odors that are highly appetizing, and unquestionably aid in the subsequent digestion of the same. With but few exceptions, foods are so altered by heat that their proper mastication becomes much easier, and cooking, therefore, materially aids in reducing them to a state in which they are much more readily acted upon by the digestive juices. It should never be forgotten, also, that cooking is of the utmost importance from the standpoint of killing bacteria and animal parasites that may be present in food. If we were to adopt universally the habit of eating everything raw, the general mortality would certainly be considerably increased.

Cooking of Starchy Foods.—Nothing in the whole art and science of preparing food for the human being is of so much importance as the proper cooking of starches. As a result of the heat employed, certain chemical changes are induced in the starch-granules, as a consequence of which they are rendered digestible.

It is of fundamental importance that at all times and under all circumstances the cooking of this class of foods should be as thorough as is possible, for when this is not done digestive disturbances are sure to follow, and much of the food is actually wasted. There are but few cardinal principles in the ordinary hygiene of life that are so commonly neglected as this, since it is the habit of a large proportion of the American people to consume three times a day masses of tenacious starch which has not been acted upon by heat sufficiently to render it digestible.

Of all the different methods of cooking starches, by far the most common, and, therefore, the most important, is the process called baking. While it is not possible in this volume to go into the subject with the thoroughness that it deserves, the principal points deserve some mention. They may be briefly stated as follows:

(1) The flour must be made into a dough in which are incorporated substances that produce a gas called carbon dioxide, which, forming in innumerable small bubbles throughout the mass, cause the whole to

swell; when this is completed the bread is said to have "risen." Of course the object of this is to produce a thorough breaking up of the sticky dough —with the result that when the bread is finally cooked it is light and fluffy, and can be readily masticated.

(2) After the process just described has been completed the bread should be thoroughly cooked, for reasons which have already been explained.

(3) After cooking has been accomplished the bread should be thoroughly dried, either by keeping it hot until this occurs, or, what is better, permitting it to remain warm for a time and then allowing the process to be completed in a natural way by putting the bread aside for several days. It is necessary for bread to be dried in order that it may be thoroughly soaked in saliva during the process of chewing.

If the principles above enunciated be properly followed out, good wholesome bread will result. There are, of course, many details connected with the preparation of food known to expert cooks into which it will not be possible for us to go here, and for which the reader is referred to any good cook-book.

Some starchy foods such as rice and potatoes, do not lend themselves readily to the production of breads, and are consequently usually cooked in some other manner. It cannot be

too strongly insisted upon that they should be rather *steamed* than boiled,—the process being usually carried out by placing a small amount of water with them and allowing it to boil away; we should remember also that the principles just insisted upon in connection with making bread apply here with equal force—we should cook thoroughly and serve both as dry as is possible.

Cooking of Meats.—Here again it is necessary to insist upon the necessity of thorough cooking. The error has long prevailed that raw meats are wholesome, but within recent years it has been clearly demonstrated that this old view is erroneous. The muscle-fibers that constitute the bulk of the nourishment of meats are separated from each other by a substance which cannot be acted upon by the juices of the stomach until it has been heated to a temperature which results in the cooking of the entire mass. It is true that the muscular substance proper may be digested without heat—resembling in this way the white of the egg, to which it is chemically closely related; by scraping meat with some dull instrument the muscle fibers may

be separated in a more or less pure state—leaving the substance that requires heat in order to become digestible behind—and after having been removed in this way, of course, may be eaten in a raw or semi-cooked condition without ill effects. In preparing meat it is not absolutely essential that it be cooked until thoroughly "done"—a slight tinge of red being allowable.

Healthful Recipes.—In an Appendix to this volume will be found a series of recipes for the preparation of common foods, for which the author is indebted to Dr. Mary E. Lapham, of Highlands, N. C. They will be found extremely practicable for making not only very palatable but thoroughly wholesome dishes; and are earnestly recommended to young housewives, who err through ignorance, as a rule, rather than because of carelessness or of lack of good materials. It has often been said that the road to a man's heart lies through his stomach. It would not be surprising to learn that this aphorism fell first from the lips of some wise woman who had observed that in a great number of cases unhappiness in home-life

had resulted primarily from lack of home-comfort, and chiefly from unvaried, unappetizing meals and table-service. Another point is well worth remembering, especially by young married women: a man whose home is pleasant and comfortable is likely to spend as much of his time there as he can—if it is otherwise, he will seek some place that has these desirable qualities, such as his club, or an arm-chair in some corner saloon. Furthermore, a man who is not only abundantly, but *nicely* fed, has far less desire for the stimulants which lead to drunkenness, than the man who is denied at home the properly cooked and seasonably varied food which his system craves. No better work in the "Temperance cause" can be done than to make an attractive home.

These are facts which many a young housewife needs to learn and keep in mind; and it is for her benefit that Dr. Lapham has prepared her simple but excellent cooking directions presented in the Appendix.

CHAPTER XII

SEVEN AVOIDABLE DISEASES

MALARIA FEVER.

Malaria, in its various manifestations, has ever constituted the principal obstacle to the civilization of all tropical and semi-tropical countries, and as a consequence vast tracts of the richest and fairest portions of the world have remained uncultivated and unredeemed from their primitive savage state. Recent investigations have shown that this disease can be easily prevented if the matter is taken up intelligently.

Malaria is a disease produced by a parasite belonging to the very lowest order of animal life—the *Plasmodium malaria,* which is conveyed from man to man by that genus of mosquitoes called the Anopheles. The parasite attacks and destroys the red cells of the blood, and produces a poison that causes the symptoms characteristic of malaria.

Course of the Disease.—The most common and well-recognized symptoms of malaria are those that occur in that variety of the disease which is known as malarial or intermittent fever. In this type the patient—who may or may not have at intervals for some days noticed chilly sensations, a feeling of fullness in the head, and general bodily depression—is suddenly seized with a chill followed by a high fever and subsequent profuse perspiration; after these symptoms subdue, which generally requires several hours, the patient returns to a practically normal condition and feels, on the whole, well until the next attack occurs. These chills-and-fever paroxysms occur at various intervals depending upon the character of the parasite inducing them, the most common form being that which produces a chill every day. In some instances the malady comes on more insidiously, there being no marked chills but only periodical elevations of temperature.

In the more chronic forms of the disease the unfortunate victim is frequently subjected for years to attacks of fever coming on at irregular intervals, the patient being more or less of

an invalid throughout the course of the disease. In other instances the brain becomes affected, producing very alarming symptoms; and in quite a proportion of cases the malady ultimately terminates in chronic Bright's disease.

Treatment of the Disease.—Most fortunately, we have in quinine, when properly administered, a medicine that in practically all instances acts as a specific in this affection; but it should be used only on the advice and under the directions of a physician. In the more chronic forms of the disease, combinations of arsenic, with such tonics as nux vomica, iron, and small doses of some of the preparations of mercury, produce permanent cures where quinine has failed. It is of the utmost importance that attention be given to the treatment, as, so long as the patient remains with the parasites in his blood, so long is he a menace to his friends and neighbors.

Mode of Infection Through Mosquitoes.—The most brilliant triumph in modern medicine, and one of the most creditable achievements of human ingenuity, has been the absolute demonstration that malaria is carried

from man to man by means of the Anopheles mosquito, and that the disease can, in nature, be produced in absolutely no other way. This is not a theory, but it is a fact which has been demonstrated in its every detail beyond dispute, and we are now happily in a condition to reject our venerable notions concerning bad air, miasm, etc.

Before describing the method by which infection takes place, it is well to say a few words concerning the mosquito that acts as a carrier of the disease, which may be easily differentiated from other similar gnats. The malarial mosquito has a body which is placed parallel to and almost on the same plane with the front portions of the insect, and as a consequence, when at rest on walls or other objects, the back of the body sticks out almost or quite at right angles with the surface upon which it is resting. The back portion of the common mosquito forms an angle with the front part of its body, with the effect that both ends of the insect point toward the object upon which it rests. There are still other differences that clearly differentiate the malarial from the common mosquito, but the one given ordinarily serves to distinguish between them. The malarial mosquito is pre-eminently a house-gnat, being scarcely ever seen in the woods or open, but may be found—oftentimes in great numbers—in all malarial localities, lying quietly during the day in dark corners of rooms or stables.

This mosquito practically never bites in the day, but will do so in a darkened room, if a person will remain perfectly quiet; their favorite time for feeding is in the early parts of the night and about daybreak—all of which accounts for the fact, long observed, that malarial fever is almost invariably contracted at night. The malarial mosquito bites and then goes back to some dark corner where it remains quiescent for forty-eight hours, at the end of which time it again descends to feed. Contrary to the general opinion mosquitoes bite many times, and frequently remain alive for months—the malarial mosquito particularly living in cellars and attics oftentimes throughout the entire winter.

If one of these mosquitoes bite a person with malaria, the parasites are sucked in along with the blood and pass into the stomach of the gnat, making their way ultimately into the body substance; here the parasites undergo a series of multiplications, a single one of them sometimes producing as many as ten thousand young malarial parasites. After the parasites have developed fully, which requires eight days in warm weather, they make their way to the venom-gland of the mosquito and there remain until it bites, when they are injected into the body of the individual attacked along with the poison.

After getting into the human blood, each parasite attacks a red-blood cell, bores into it, and grows at the expense of the cell until it reaches maturity, at which time it divides up into from seven to twenty-five young parasites which are liberated and each in

turn attacks a new cell. This process goes on until a sufficient number of parasites are produced in the individual to cause the symptoms of malaria, and the new subject of the disease thereafter becomes a source of danger to others in the vicinity through the intervention of still other malarial mosquitoes.

Malaria Avoidable.—From the foregoing it is seen that the proper way to avoid malaria is so to screen houses that mosquitoes cannot enter them. Persons in malarial districts should not sit on open porches at night, and should be careful to sleep under properly constructed nets. If this be done, there is absolutely no danger of anyone ever contracting the disease. It will be well observed that these precautions are not necessary in the daytime, as the malarial mosquito rarely attempts to bite during this period.

It should be remembered by those who have the disease that they are a constant source of danger to people living in the vicinity, and they should be doubly careful as long as the disease persists to avoid being bitten by mosquitoes at night. It is furthermore their duty to vigorously treat the disease until the para-

sites are no longer present in their bodies, at which time they cease to be a menace to others.

Many children have malaria without showing symptoms, and, if allowed to sleep without being properly covered with a net, are very apt to infect a large number of malarial mosquitoes; the blood of children in malarial localities should be examined from time to time, and if the parasites be found, the children should be given the proper remedies until a cure is effected.

Particular attention should also be directed to the fact that almost all Negroes in malarial localities of the South harbor the parasites, though very few of them show symptoms of their attacks. It is, therefore, very important that they be treated properly, and their white neighbors should see to it, for their own safety, that they do not sleep in houses unprotected by nets.

If the precautions herein detailed were properly carried out, for even a few months, malaria would practically cease to exist wherever this was done, and would not recur unless individuals from other places suffering from the dis-

ease were to come into the districts where the Anopheles mosquito is present, and so give it to the gnats—to be by them recommunicated to humanity.

TUBERCULOSIS.

Of all the enemies of mankind, tuberculosis, in its various forms, takes the first rank. Of protean manifestations, occurring in almost every part of the body and producing diseases of the brain, of the nerves, of the bones, of the skin, and of all of the internal organs—pre-eminent is the terrible malady we call consumption, which is tuberculosis of the lungs. It has been estimated that one-seventh of all the people born into the world die as a result of this malady in some one of its various forms, and it is probable that one person out of every three dying between the ages of fifteen and sixty years, succumb to this disease. As a result of the labors of thousands of patient, self-sacrificing investigators—many of the most distinguished of whom have died of this disease while carrying on their work—the peculiarities of this affection are now fairly well

understood, and if we were to apply the knowledge which we now possess in our attempts to free ourselves from its ravages, there is no question but that within a comparatively short period of time the disease would practically cease to exist.

Character and Course of the Disease.—Tuberculosis is produced by a minute vegetable parasite known as the *Bacillus tuberculosis,* a germ which not only occurs in the human being, but is widely distributed among the lower animals. Tuberculosis of the lungs (to restrict ourselves to this most important manifestation) generally comes on insidiously, there being usually no definite period from which the sufferer can date the onset of the malady. In the early stages there is usually loss of appetite and a pronounced feeling of weakness followed by a slight cough; the latter symptom frequently leads patients to erroneously believe that their trouble began with a bad cold, when as a matter of fact, the catarrhal trouble of the throat and bronchial tubes was originally produced by the germs of tuberculosis—there being no such thing as a cold changing into consumption. As

the disease progresses the patient complains of fever and chills, these symptoms being oftentimes periodical, and lead to the belief that the trouble is malarial fever: this mistake is very common, and whenever such symptoms appear a good physician should be immediately consulted. The patient also suffers from exhausting night-sweats in many instances, though this is not invariable. A rapid loss of flesh is one of the earliest and most common symptoms. The symptoms above enumerated continue and grow worse, and in quite a proportion of the cases there is, in addition, spitting up blood, which in some instances may be so pronounced that it becomes a distinct hemorrhage. In the more rapid or "galloping" forms of the disease the patient frequently dies within a few weeks or a month or so, while in the less severe types the malady may persist for many years before death occurs.

Treatment.—The treatment of tuberculosis by drugs has proven an entire failure, but a large number of persons afflicted with this disease will recover, if placed under proper hygienic conditions.

The patient should be put on a porch or in a tent, whether it be winter or summer, and kept in bed at absolute rest as long as there is any fever, and should be fed in abundance with good, wholesome food. While this treatment appears simple it should always be carried out under the directions of a physician, as it is only possible for those having a thorough knowledge of the subject to give such directions as would lead to a rapid cure of the patient.

Modes of Infection.—Hereditary tuberculosis, notwithstanding a popular idea to the contrary, is very rare, but there is no question that those persons in whose family tuberculosis exists are much more prone to contract the disease than others. In just what manner the germ of consumption gains entrance to the human body, we are more or less uncertain, but there are reasons for the belief that in many instances they pass in by means of the inhaled air; there is no doubt that in a small percentage of cases the bacillus gains entrance to the body through an abrasion of the skin or of some mucous membrane; finally the bacteria are

often taken in with the foods that we eat, or by putting objects upon which the germs are present into the mouth, or eating with hands which have been contaminated and not washed. Of the foods that contain the germs of consumption, milk is unquestionably the most common, as there can be no question that fully 25 per cent. of our cows have this disease, and under such circumstances their milk is usually infected with the bacillus that produces the malady; meats, likewise, often contain germs of this disease, but, as they are usually cooked, no harm, as a rule, results.

Of quite as much importance as the introduction of the germ into the body is the resisting power of the individual at the time when this occurs, since the disease can make no progress unless the tissues have become susceptible through lowered resistance. All things then that have the effect of lowering the vitality of the body act as predisposing causes to consumption; such, for example, as *WANT OF PROPER FOOD, LACK OF SLEEP, IMPROPER CLOTHING IN COLD AND WET WEATHER, AND LIVING IN DAMP AND*

IMPROPERLY VENTILATED HOUSES; excesses, *PARTICULARLY THE TAKING OF ALCOHOL,* conduce to the development of the disease—long-continued inebriety being beyond doubt the cause that most frequently leads to consumption. It is a common error that alcoholic stimulants tend to ward off consumption, and it is absolutely certain that these substances not only do not act in a curative way in those who have already contracted the disease, but are positively detrimental. In order then to avoid consumption—and this is particularly of importance for those in whose family there is a predisposition to the disease—the individual should live soberly, should try at all times to obtain a reasonable amount of good food, should sleep a sufficient number of hours, and should be clothed properly, particularly in the winter. Those who devote their time and energy to the performance of their work—being careful of course not to labor excessively—are much more apt to escape consumption than those who do otherwise. It is particularly of importance that those who have a tendency towards consumption should early learn, and

throughout life practice, the habit of *BREATHING THROUGH THE NOSE:* if this rule be followed a large percentage not only of the germs of consumption, but other bacteria as well, are filtered out during their passage through the nose and do not reach the lungs. Cleanliness is also of much importance—a bath taken each morning in moderately cold water being conducive to health, not only as regards consumption but other diseases as well. It is of course necessary that dwelling houses should be kept thoroughly clean.

Advice to Diseased Persons.—In all cases where a person observes in himself, or in those for whom he is responsible, the symptoms already detailed, it is his duty to at once consult an intelligent physician, and if it be found that tuberculosis is present, every precaution should be taken by the diseased individual to prevent the further spread of the malady. *IN SUCH A CASE THE SPUTUM THAT IS CONSTANTLY BEING COUGHED UP CONTAINS MYRIADS OF THE GERMS,* and it is of the utmost importance in order to prevent other persons in the neighborhood from being infected that this *SPUTUM BE DESTROYED.* The patient should at all times carry about with him either a small receptacle into which the sputum can be ex-

pectorated, or a large cloth which would answer the same purpose, and in either case the sputum should be burned; if this be impracticable, it should be placed in some good antiseptic, such as a saturated solution of carbolic acid or a 1-to-1,000 solution of corrosive sublimate in water. The patient's handkerchiefs should be thoroughly boiled, and his clothing should receive like treatment. Every precaution should at all times be observed in order to prevent the sputum getting onto the furniture or floors, as, under such circumstances, it quickly dries and being broken up into small particles is carried by means of the air to other parts of the house.

The patient should always remember that the quicker he is placed under proper treatment the more the chances of ultimate recovery; in the early stages almost all of the cases of this kind are curable, but later this is not often accomplished.

TYPHOID FEVER.

Of all of the infectious diseases prevalent in the United States, typhoid fever is one of the most common and fatal. As a result of its ravages a vast amount of invalidism, suffering and financial loss is brought about each year, and a frightful mortality results. It has for some time been recognized that typhoid fever is among the most preventable of all diseases, and if our people would bestir themselves and

carry out the comparatively simple rules that are necessary for its prevention, the scourge would, in a short time, practically cease to exist among us.

Character and Course of the Disease.—Typhoid fever, enteric fever, or abdominal typhus, is an infectious disease believed to be caused by a specific bacterial germ known as the *Bacillus typhosus.* It develops, as a rule, quite slowly, the first symptoms being loss of appetite, headache, and a marked fatigue on slight exertion. These symptoms gradually grow worse, fever develops, and the patient oftentimes suffers with chilly sensations; the temperature gradually rises, and in the course of from a few days to a week reaches a height of 102 degrees, 103 degrees, 104 degrees, or 105 degrees F. In many cases no symptoms exist that indicate trouble with the bowels, but in the severe forms of the disease diarrhœa generally comes on during the first week and continues throughout the course of the disease.

During the second week the symptoms above detailed continue, becoming often more severe, and there develops great nervousness and de-

lirium. About this time there are frequently observed over the chest, abdomen and thighs, minute reddish spots resembling flea-bites; these spots last for a few days and then pass away and are followed by a fresh crop in other situations. During this period of the disease inflammation of the bronchial tubes frequently comes on, and now and then pneumonia develops. Bleeding from the bowels is an occasional highly characteristic symptom of the second week. When the disease follows a normal course, the symptoms during the third week begin gradually to abate; the fever lessens, and the patient, though much emaciated, gradually returns to a normal condition.

Unfortunately, however, the disease does not always pursue this favorable course, for, in quite a proportion of instances, the symptoms increase in severity during the second or third week, the patient becomes profoundly prostrated, the delirium deepens, and death occurs. The hemorrhage from the bowels, in some instances, is so severe that death is produced even in comparatively early stages of the affection.

In many instances, through indiscretion, usually as a result of eating solid food, patients who are apparently on the road to rapid recovery, relapse, and the disease repeats the course already detailed.

It is of importance to remember that now and then so-called walking cases of typhoid fever occur, the disease in these instances being characterized by the fact that the symptoms are so slight that the sufferer does not feel it necessary to go to bed. However, in these mild cases, fatal hemorrhage from the bowels is as frequent as in the severer types, and as a consequence the patient should receive careful attention. Moreover, it is of importance to remember that from this mild form of the affection the most malignant varieties of the disease may be contracted.

The mortality in typhoid fever varies from five to twenty per cent., depending upon the character of the disease and the nature of the nursing and treatment that the patient receives.

Modes of Infection.—It is clear that typhoid fever is the result of the entrance into the body of some minute form of germ-life, whether this be the bacterium generally supposed to induce the disease or not. This contagion is beyond question a living something which multiplies with great rapidity under proper conditions, and, escaping from the bodies of those infected with the disease, in one way or another, reaches other individuals. It is beyond question true that the virus passes from the body of those infected by means of the urine and feces, and it

is likely that the secretions from the mouth and nose frequently contain the germs that cause the fever.

As the germs are certainly extraordinarily minute, a very small amount of any of these excretions might produce the disease in healthy individuals if it were to get into their bodies through water, milk, or any uncooked food, or if it were to find lodgment about the nose or mouth, or get upon the hands of other persons. It should also be remembered that the virus may easily get upon cooking-utensils, drinking-cups, bed-linen, and other articles with which we are constantly brought into close contact, and that the disease might be transmitted in this way. It is also true that the malady may be carried from place to place by insects, particularly flies; the latter may readily get enough infectious material upon their legs in various ways, and then, crawling over the food, leave the deadly poison deposited upon it.

Treatment of Typhoid Fever.—As soon as the symptoms appear, a physician should be called and his directions faithfully and carefully followed out. Nothing in this disease is

of more importance than careful nursing, and it is absolutely necessary that the patient receive only liquid diet until the physician permits other food.

Wherever possible then, patients with typhoid fever should be completely isolated, since, if this is not done, other members of the family are almost sure to contract the malady—a result which almost everyone has seen who has had any experience with the disease. Whereever possible patients should be sent to a hospital, but where this cannot be done they should be placed in an outhouse, if practicable, or in an isolated room, which should be thoroughly disinfected after the patient's recovery. No one should visit a typhoid-fever patient, except when compelled to do so, and we should be particularly careful to prevent children from coming in contact with them, as it has been shown that they contract the disease much more readily than grown people. It is also of importance that persons should not sit for any length of time in the sick room, and, above all, under no circumstances, should cooking and eating be done there. The room in

which the patient is placed should be furnished only with those things absolutely necessary, and it is particularly desirable that carpets and curtains should be removed. It is well to wash the floor each day with some antiseptic solution.

Those persons who come in contact with typhoid fever should wear outer clothing which can be easily washed and boiled. After touching the patient, or any of his clothing, the hands should be at once thoroughly scrubbed in an antiseptic solution. Of course, under no circumstances, should the nurse eat or drink from the same vessels that the patient does.

None of the excretions from persons afflicted with typhoid fever should ever be emptied until thoroughly disinfected with creo-carboline or strong lime-water, and under no circumstances should these be poured out in the neighborhood of springs or wells. Towels, handkerchiefs, and clothing that comes in contact with the patient should be thoroughly disinfected before being sent to the laundry. This is best accomplished by thorough boiling, but in cases where this can not be at once carried out, it is advisable to use some chemical antiseptic; of these, perhaps

the best is creo-carboline, which may be employed in a 1-500 solution in water; where this solution is not obtainable, a 5-per-cent. solution of carbolic acid in water will answer. It should also be remembered that the water in which typhoid-fever patients are bathed necessarily becomes infected, and this should always be thoroughly disinfected before being emptied. These precautions should be carried out for some time after the patient has recovered, as it is well known that persons, under such circumstances, for some time frequently contain the poison in their evacuations.

After the patient recovers, the room should be disinfected with formaldehyde gas obtained from the substance known as "formalin." This gas may now be obtained from the formalin without the use of heat in the following manner: When everything is ready, and the room properly sealed, thirteen ounces of permanganate of potash to each quart of formalin are placed in a large vessel, the room being closed immediately after the two substances are put together; it is important that the permanganate be placed in the vessel first. When this method is employed a quart of formalin should be used to each one thousand cubic feet of air-space in the room. As the gas, by this process, comes off with great

rapidity, it is not necessary to keep the room closed more than about four hours. This method is to be advised for the reasons that it acts more quickly than the older one, and there is never danger of fire.

In cases where houses are too open to permit of disinfection by means of gas, the sick chamber should be thoroughly washed with a solution of corrosive sublimate, carbolic acid or some other good disinfectant.

HOOK-WORM DISEASE.

It has been only recently recognized that a large percentage of the invalidism and a great number of the deaths yearly in the southern portion of the United States are caused by a very small intestinal parasite known as the *Necator americanus,* or hook-worm. This parasite has unquestionably existed over the area just named since the advent of the Negro—recent investigations having shown that the worm is in all probability of African origin. This hook-worm disease is probably the most common of all the serious diseases prevalent in the South, and as it is easily curable, and can be readily prevented, there is no matter which should be of greater interest to the people in the infected regions, especially those who live in villages or on farms.

Character of the Disease.—The animal parasite called hook-worm closely resembles, externally, the pin-worm which so often occurs in children. The female, which is larger than the male, measures somewhat more than half an inch in length, and has the thickness of a knitting-needle; the male is between a quarter and three-eighths of an inch in length as a rule. The parasite possesses around its mouth a row of minute plates somewhat resembling hooklets, by means of which it grasps hold of the mucous membrane of the intestine and bruises it sufficiently to cause the blood to flow; with this blood the parasite nourishes itself. At the same time the worm injects into the tissues a poison which has much to do with the symptoms that occur in the disease that it produces.

These worms are usually present in great numbers, there being as a rule from 500 to 2,000 of them, and as they unquestionably live at least eight or ten years, the unfortunate victim suffers for a long period of time as a result of their presence. While living in the intestines the females lay enormous numbers of eggs which pass out with the feces, and under

suitable conditions of temperature and moisture there develops within each of them, within from two to three days, a minute snake-like embryo which bursts through the shell of the egg and passes into the neighboring earth. Here the embryos live for considerable periods of time, and, ultimately, may infect other individuals, or those from whom the eggs were passed. There are at least two ways by which these embryos gain entrance into the human body. Some do so by getting into drinking-water and being swallowed; but, extraordinarily, they most frequently penetrate through the skin. When this happens the parasite, in passing through the skin, produces the disease known as "ground-itch." The vast majority of the victims of this affection are children with whose skin the embryo comes in contact while they go barefooted during the summer months.

Course of the Disease.—Having entered through the skin, the embryos of the hook-worm, moving by a circuitous route finally reach the intestines, and, grasping hold of the mucous membrane with their saw-like teeth, they begin

to suck blood and grow until they reach the size of the adult worm in about a month or six weeks. Depending upon the number which have gained entrance, and the susceptibility of the individual, there now begins to develop symptoms of profound anæmia; the skin of the child becomes very pale, and assumes a sort of yellowish hue, and in cases where there is a severe infection, the victim begins to suffer with shortness of breath and dropsy. When this occurs the patient sometimes dies, but more commonly death results from contracting some other disease, which, under ordinary conditions, would produce no serious results. One of the most unfortunate effects of this malady is that when children become infected they cease to grow, and frequently retain the appearance of early youth even after they have reached full maturity in years. These unfortunates are generally incorrectly regarded as dirt-eaters. The symtoms frequently last over a period of many years, as in the intestines of these victims the worms that originally infect them live certainly eight or ten years, and during this period

it is beyond question true that additions to the original number are frequently received.

Diagnosis and Treatment.—There is no disease that can be diagnosticated with more ease and certainty; the eggs are present in the feces in great numbers, and by means of a microscope they can always be detected. In all cases where the disease is suspected, a half-teaspoonful of the feces of the person supposed to be infected should be placed in a bottle and sent to a competent microscopist for examination. This is done free of charge at the laboratories of most State Boards of Health in those parts of the country where the malady exists. Whenever an individual shows the symptoms above detailed, an intelligent physician should at once be called. We have medicines that act as specifics, and the disease can always be cured in a very short period of time.

Preventive Measures.—Of course the best method of preventing this disease is to administer to those already infected the proper medicines, and cause the expulsion from the intestines of the worms that lay the eggs.

The indiscriminate scattering of the feces

around the stables, so very common in many districts, should be absolutely forbidden. Around the house where individuals have lived who have the disease every care should be taken to prevent contact with the earth in the neighborhood of places where the ground might have become infected. It would be advisable for children and others to wear shoes for at least a year after the last individual having the disease was cured; and as a precautionary measure it should be insisted upon that properly constructed privies or water-closets should be at every house, and that they should be used by everyone in whom there is a possibility that the disease exists.

DIPHTHERIA AND ITS TREATMENT.

Loeffler's discovery in 1884 of the germ of diphtheria, and its relation to the disease of the same name, established the specific infectious nature of this malady, and demonstrated beyond a doubt that membranous croup is not ordinarily an independent affection, but is almost always simply diphtheria of the wind-pipe. The discovery of antitoxin, some time later, re-

duced the mortality of diphtheria from an average of 30% to 10% in ten years; its use has also shortened the course of the disease, and decreased greatly the frequency of the paralytic conditions that not uncommonly follow this malady.

Character and Course of Diphtheria.—Diphtheria is an affection caused by a bacterial microbe which produces a poison that acts locally upon the tissues invaded, and also, as a result of its introduction into the general circulation, brings about more or less profound effects on the entire system.

The period of incubation is from two to ten days. The onset is generally characterized by a rise of temperature from 100° F. to 104° F., chilliness, headache, and pain in the back and limbs. Albuminuria is common. The glands of the neck often become swollen. In mild attacks a slight sore throat is all that is complained of. In the majority of cases the disease attacks the throat and tonsils, and is characterized locally by the appearance of a membrane, which is usually gray or yellowish-white, elastic, and adheres tightly to the surface upon which it lies.

At times, however, the membrane is soft and pliable, and is easily separated from the tissue; such cases are frequently diagnosticated as follicular tonsilitis. A bad cold is occasionally the only symptom of the disease. The diagnosis should always be confirmed by bacteriologic examination. In some instances the wind-pipe is primarily attacked, but when the disease affects this part of the throat it is generally a consequence of the extension of the membrane downward from the region of the tonsils. In the former case the diagnosis is somewhat difficult, as cultures taken from the throat may not show the presence of diphtheria bacilli, though material that is coughed up may contain myriads of the germs; in this phase of the disease interference with respiration is the symptom most to be feared. The mucous membrane of the nose, eyes, ears and generative organs, may be affected. Wounds are also liable to become infected with this organism. In rare instances the membrane may extend down into the bronchial tubes and lungs, and has been found on post-mortem examination covering the inside of the stomach.

As complications we may have broncho-pneumonia, acute Bright's disease, inflammation of the internal structures of the ears, bleeding from the nose, inflammation of the valves of the heart, and sometimes paralysis of this organ, with death; the last named sequel of diphtheria comes on during convalescence, usually from two to four weeks after the subsidence of local symptoms, and is due to inflammation of the nerves that control the heart. Much less commonly paralytic conditions of the palate, throat, eye muscles and the nerves of taste occur, and under rare conditions, paralysis of the lower extremities. Paralysis of some kind follows in from ten per cent. to fifteen per cent. of the cases, and appears with equal frequency after the mildest as well as following the most severe cases.

Mode of Infection.—The germs of diphtheria may be carried in articles used by persons with the disease, or they may be communicated by direct contact. The micro-organism is found in the secretions from the mouth, throat, or nose, and in particles of detached membrane. Bedding, utensils, etc., used in the room where a pa-

tient has diphtheria, are liable to carry the germs if taken from the sick-room, and consequently should be always properly disinfected before being removed. Milk-bottles carried into the sick-room, or handled by persons caring for the patient, should never be returned to the dealer without being disinfected. Cats, and less frequently dogs, may contract the disease and convey it to those with whom they come in contact. Unrecognized mild cases are a frequent means of spreading the disease, as also is a too early release of patients after recovery. It is a much safer method of procedure to require at least two negative examinations before releasing a patient from quarantine, as during convalescence the germs may be entirely absent on one day and a few days later be quite abundant. The bacilli may remain in the throat from a few days to several years after the disease is apparently entirely well, and under such circumstances the persons carrying them become quite as great, if not a greater, menace to those with whom they came in contact as they were during the height of the disease. A thorough disinfection of the room and

everything used about the sick person should be carried out after the patient is released. Complete isolation should be observed during the illness, and as long as the bacilli remains in the throat.

Treatment.—Diphtheria antitoxin is the specific treatment of this malady, and should be given early in the disease. The chances of recovery decrease in proportion to the length of time existing between the onset of the affection and the time of administration of the drug. Antitoxin may be repeated in six hours after the initial injection if improvement is not noticed, but ordinarily twenty-four hours should elapse between doses. It is well to remember that it is safer to give too much antitoxin than too little. The initial curative dose varies from 2,000 to 5,000 units, according to the age of the patient and the severity of the disease. When a case is seen late it is often advisable to begin with a large dose,—it being good practice under such circumstances to use at once as much as 10,000 units or even more. The average case requires from the beginning to the end of the treatment a total of from 10,000 to 20,000 units,

but occasionally 50,000 or even 100,000 units may be necessary. There are very few risks in giving antitoxin. In a series of 50,000 cases treated with it only two deaths occurred sufficiently early after the injections to warrant the belief that this unhappy result was produced by the drug. It is worth remembering that asthmatic cases bear the administration of antitoxin very poorly; a marked and sometimes serious embarrassment of respiration, with cyanosis, unconsciousness, and general collapse may follow its use, but recovery is usual in such cases.

A condition known as anaphylaxis or hypersensitiveness, which at present is being much studied, may sometimes occur in the human being. This hypersensitiveness is manifested by the extraordinary peculiarity that any number of doses of antitoxin may be given provided they are administered within a period of less than ten or twelve days. On the other hand a single minute dose may induce this state after the period named, and, as we never know whether a patient is going to develop it or not, it becomes a question as to the safety of giving a second injection after ten or twelve days have elapsed following the administration of the initial treatment. As it is true that this hypersensitiveness once established in animals may continue throughout life, it becomes a question as to whether or not it is quite safe to administer anti-

toxin to an individual who has had the drug given him at some prior time, and we are not as yet in a position to definitely determine the risks that are involved in such a procedure. There is no reason to doubt that this hypersensitiveness is much less marked in man than in the lower animals, and there can be no question that it much less commonly develops, but notwithstanding this it would be the part of prudence to avoid a second administration of the drug after the interval referred to in all instances where this seems possible. Anaphylaxis is thus seen to bear as important relationship to what is commonly called the "immunizing treatment" to prevent diphtheria, which consists in giving a moderate dose of antitoxin to a person immediately after exposure to the disease. Under such circumstances a degree of immunity is undoubtedly secured, but this passes off in the course of a few weeks, and the patient then becomes just as susceptible as he was before. Should he now contract diphtheria, we would be confronted with the possibility that the treatment by means of antitoxin might possibly produce serious and even fatal results.

Occasionally rashes occur several days after the inoculation, but such disturbances are insignificant except for the immediate discomfort experienced. Antitoxin concentrated by the Gibson method has reduced to a considerable extent the number of cases in which rashes occur.

Treatment other than by antitoxin is symptomatic. Where the disease occurs in the wind-

pipe, it may be necessary to pass a tube into its upper opening to allow the patient to breathe, and in other instances the wind-pipe is itself opened from the outside in order to permit a sufficient amount of air to enter the lungs to maintain life.

It is of the utmost importance that patients be kept in bed until all danger of complications has passed. Death from heart-failure several weeks after the diphtheria in the throat is well, is not an uncommon result of the disease, and is especially prone to follow even the slightest exertion. Patients under such circumstances have been known to die from raising themselves up in the bed.

CEREBROSPINAL MENINGITIS.

Meningitis, or spotted fever, is one of the most terrible and fatal of all diseases, every case proving fatal in some local epidemics.

Although the cause of the disease has been known for a number of years, the exact method by which the germ that produces it spreads from man to man was until quite recently entirely unrecognized, and even now it cannot be

said that the whole matter has been demonstrated.

Character and Course of the Disease.—Cerebrospinal meningitis is produced by a minute vegetable (bacterium), the *Micrococcus intracellularis.* This germ does not appear to occur normally in any of the lower animals, nor has it been found in the outer world, and is therefore to be regarded as distinctly a human parasite. It is very fortunately a germ of low vitality, as it develops only at about blood heat, and when expelled from its normal dwelling-place in the human body it dies very quickly.

The accompanying illustration shows how these bacteria appear under the microscope; the drawing was made from fluid taken from the spinal canal of a patient suffering from cerebrospinal meningitis. These germs get within the skull and spinal canal, and produce violent inflammation of the coverings of the brain and cord; these membranes are called "meninges," hence the name "cerebrospinal meningitis." Within a short time after their entrance pus is produced, and the condition becomes practically one of abscess around the brain and spinal cord.

In almost all cases the disease is preceded by a slight catarrhal condition of the nose and

throat, the symptoms being those of an ordinary cold. The symptoms that point to the covering of the brain being attacked come on with great suddenness; there is usually a chill, followed by intense headache, vomiting, restlessness, with great dread of noises and bright light; in many cases reddish spots appear beneath the skin, and these are usually tender on pressure. In some cases the muscles of the neck become very stiff, and contract so that the head is drawn backward. The temperature is somewhat irregular, but is always above normal in the beginning, and sometimes goes very high; the pulse as a rule is normal, or but little accelerated. After the patient remains in this condition for a period varying from a few hours to several days, he generally becomes unconscious, and in a comparatively short time dies. In some cases the symptoms after starting off very violently quickly subside, and the patient makes a comparatively rapid recovery. In other instances the disease begins more mildly, the patient having more or less of the usual symptoms, but not so severely as is ordinarily the case; in such cases the patient may die, after lingering

weeks or months; or may make a protracted recovery, frequently with partial paralytic conditions that permanently remain.

Unfortunately we possess no specific for this disease. Recently there has come into vogue a treatment by a serum supposed to have antitoxic power against this disease, but its exact value is, as yet, by no means settled; it must be used early if any good is to be expected from it. In addition to the antitoxin all that can be done is to keep the patient quiet with anodynes, and to minister to his comfort in every way possible. Ice applications to the head sometimes alleviate the intense headache. As the disease is practically an abscess around the brain and cord, perhaps the most rational treatment would be to open up the skull and let the pus drain away.

Mode of Infection.—As this disease is one that is due to a specific germ it is obvious that it cannot exist without the presence of this organism; the malady is therefore infectious, and must necessarily be to a certain extent contagious, notwithstanding the fact that it is generally thought not to be so. The reason that the affection has not been thought to be contagious may be explained by the following facts: Recent investigation has shown that in many, if not all, instances of this disease, the germ may

be found in the nose and throat, where, as has already been explained, it sets up a condition resembling an ordinary cold. In all probability the infection takes place in the nasal cavity first, and the germ ultimately finds its way to the coverings of the brain. Now there is every reason to believe that in many, and probably in a great majority of instances, the germ goes no further than the mucous membrane of the nose, and the patient merely has as a consequence what he considers an ordinary cold. It is clear, however, that if another individual, who was very susceptible to this germ, should contract the disease from this person, he might have the meningeal form of it. In other words, it is probably true that the vast majority of people who are attacked by this organism simply get colds as a consequence, and only now and then does a person get meningitis as a result. This explains why the disease does not ordinarily appear contagious.

The facts above stated are of much importance in combating the spread of this disease. People who are exposed to those having meningitis should be exceedingly careful not to get

upon their persons any of the secretions that come from the patient, and during periods of epidemics those who observe a bad cold coming on should promptly consult their physicians, and do everything to prevent the development of all catarrhal conditions in their noses.

During epidemics persons with colds should be very careful not to allow other people to become infected from them. As cold and wet are undoubtedly predisposing causes to colds it is well for everyone to shun such exposure during periods when meningitis is prevalent; debilitating influences, such as alcoholic excess and lack of sleep, should also be avoided.

HYDROPHOBIA.

This disease, as it occurs in man, is practically always conveyed by the bite of some animal, the dog being the usual offender. The poison is present in the saliva of the diseased animal and is transmitted through wounds made by its bite.

As observed in the dog, there are two types of the disease,—one the "furious," the other the "paralytic."

In the furious type the animal first appears to be restless and somewhat excited. He seeks dark places and apparently prefers to be by himself. In this stage of the disease the dog's appetite is good and may be excessive; he responds to orders although his attention can be attracted only for a moment at a time. As the malady progresses the animal becomes more and more restless, and develops a desire to tear those things about him into pieces. There is described a peculiar bark at this stage of the disease; instead of ending as it ordinarily does, it is prolonged and terminates in a higher pitched note simulating a cry. This is supposed to be very characteristic at this stage of the affection. The appetite gradually diminishes, food is refused, and swallowing becomes difficult. As the symptoms gradually progress the dog shows signs of delirium and begins to wander. As a rule, he goes about with his tail hung, mouth wide open, and with a wild look in his eyes, biting as he goes, anything that happens to be directly in his path; seldom does he turn aside to disturb anything or anybody. In the later stages of the disease paralysis generally develops, beginning in the hind legs and soon involving the body. If the animal be now carefully observed it will be seen that he cannot swallow. There is no dread of water, as the name "hydrophobia" implies, and as is commonly thought, the animal often attempting to drink, but owing to the paralysis of the muscles of the throat this is impossible. Inability then to swallow either water or solid food is one of the surest and

most reliable signs of rabies. Weakness becomes very marked, and the animal finally lies down in a stupor and dies. The entire course of this type may last from six to ten days; generally it is four or five.

The paralytic type of the disease occurs in fifteen or twenty per cent. of the cases. The onset is, as a rule, the same as that observed in the furious type. Instead, however, of the dog beginning to wander, as previously mentioned, the animal becomes paralyzed, the paralysis first affecting the muscles of the jaw, later of the tongue. As is the case in the furious type of the disease, the animal loses the power to swallow both solids and liquids, but has no fear of water. The mouth remains wide open, the tongue protruding, and an abundant amount of thick saliva exudes. The animal remains quiet, does not attempt to bite any animal or individual. Death occurs on the second or third day of the disease.

Precautions.—When an individual is bitten by an animal either supposed or known to be rabid, the would should be immediately cauterized with some caustic, preferably concentrated nitric acid. This should be applied without fear because it is safer to use too much than too little. In case this is not available any strong caustic may be used. Punctured wounds should be laid open with a knife and the surfaces freely cauterized. It should not be forgotten

that the slightest scratch from the tooth of a rabid animal may lead to the development of hydrophobia in man, and it therefore behooves all persons bitten by dogs to take every precaution possible. Even though the animal at the time may appear to be healthy, some strong antiseptic should be applied to the wound, and the animal carefully watched until all possibility of his having the disease has passed. Many persons have died from slight wounds inflicted by animals appearing at the time to be perfectly well.

Attention should also be directed to the fact that wounds where the teeth of the animal pass through the clothing are not so dangerous as those where no such protection intervenes. Bites about the face and head are much more frequently followed by rabies than those inflicted on the extremities, and, of course, where wounds are deep the chances of infection are much greater; where injuries of the latter kind are inflicted it is practically out of the question to thoroughly cauterize them, and the patient should immediately receive the Pasteur treatment. It is probable that if thorough cauteriza-

tion be not done within five minutes that it cannot be relied on to prevent the development of the disease; where there is any doubt the only safety lies in the Pasteur treatment. Where a person is bitten by a dog supposed to be rabid the animal should be caught, if possible, and kept carefully isolated for at least ten days; should it appear well after the expiration of this period no fear need be felt as to the results of its bite, but if it should die the head should be cut off, packed in ice, and sent to some laboratory for examination.

Under no condition should the animal be killed, as the best possible proof of the harmlessness of its bite would lie in its continuing to live.

Treatment.—Since the epoch-making researches of Pasteur, laboratories have been installed in various parts of the world for the purpose of making a vaccine by means of which it is possible, by gradual immunization, to prevent the development of hydrophobia in persons bitten by rabid dogs. This is done by a series of injections of a weak virus prepared according to the directions of Pasteur. *It should always be remembered that no harm can come*

from the treatment whether the patient was bitten by a rabid dog or not, and that in all cases of doubt no hesitation should be felt in resorting to it.

CHAPTER XIII

HYGIENE OF THE SICK ROOM

Far too little attention is generally accorded to the proper care of the sick,—the prevailing opinion being that the royal road to recovery under the circumstances is opened up only through the taking of drugs, and that provided the appropriate ones be given in sufficient quantities recovery will result. No greater mistake is possible. As a matter of fact, there are very few diseases for which we have medicines that act in a specific manner, and far more is usually to be hoped for from good nursing. Fortunately the general public is beginning to recognize the truth of the statements just made. It has only been a short time since the trained nurse was unknown except in the larger medical centres, but now her presence and beneficent influence is being felt from one end of the land to the other, and her importance is destined to increase with the onward march of

time; she is undoubtedly the greatest advance that we have made in medicine during the last decade.

Where persons are ill they should always be attended by a trained nurse if possible, but if this is out of the question a few suggestions as to the sick room and its hygiene should certainly not be omitted from any book dealing with rural sanitation.

Ventilation and Warmth.—The sick room if possible should be located on the sunny side of the house, and should have fire in a fire-place if the weather be cold. It is of the utmost consequence that the room have windows and doors by means of which it can be at all times thoroughly ventilated. At all seasons of the year a room on the lowest floor of the house is more satisfactory, since it is warmer in the winter and cooler in the summer. The room should not be uncomfortably cold, though it is much better to have the temperature too low than to have the air stuffy. In most diseases ventilation is of supreme importance, and should be secured at any cost. Where, however, it is compatible with thorough ventilation, a temper-

ature of about 70° F. is generally considered most desirable.

Before a patient is moved into a room all superfluous furniture should be taken out, particularly carpets and hangings of all kinds. It is likewise of the utmost importance that all insects, particularly flies, be excluded by proper screening.

The patient's bed should be narrow, and a mattress is much to be preferred to a feather bed. The mattress should be protected by a rubber sheet or newspaper pads; oil-cloth cracks and wrinkles too badly to be of service for this purpose. The rubber sheet should of course be kept under the sheet nearest the mattress. The cover should consist of a sheet which is long enough to fold back at the head over the other covering for some distance, and blankets should be used for warmth in preference to quilts. The bed should be kept scrupulously clean, and the linen and covering should be removed when soiled. The nurse should see to it that bread-crumbs do not remain in the bed.

In removing soiled bed-clothes the following

plan is the one usually adopted. The patient is moved to one side of the bed as near the edge as possible, and the sheet beneath him loosened at the head and the foot and on the opposite side; it is then rolled up toward the patient and pushed well up under him, leaving the side of the bed opposite to that upon which he is lying bare; upon this the new sheet is placed, which is then tucked under the edges of the mattress, and the patient rolls or is pulled back over on it. The soiled sheet is then removed and the edges of the fresh one pulled over the portions of the bed still uncovered, and secured in the usual way.

General Precautions.—The room should also be kept scrupulously clean; all sweepings should be burned. Soiled linen and all excretions from the patient should be promptly removed, and if the latter need not be preserved for the inspection of the physician, should be at once disinfected and properly disposed of. Milk and other food should not be left in the sick room; and soiled glasses and dishes should be removed and washed at once in boiling water.

Persons who are ill should not be allowed to have company. There is nothing more important in connection with the looking after patients with infectious diseases than this precaution. The writer has often seen in the country districts patients with typhoid fever and other infectious diseases surrounded by the neighbors from miles around,—the entire company often eating and drinking in the room occupied by the afflicted person. The strain that results on the patient from a practice of this kind might well in many cases have fatal consequences, and there is no question whatever that many diseases, particularly typhoid fever, are scattered in this way from house to house and from one community to another.

The diet should be given regularly and should consist strictly of only such things as are allowed by the physician.

All medicines should be given absolutely according to directions, as otherwise having a doctor is worse than useless.

All patients should have a daily bath, special attention being given to their hair, teeth, mouth

and nails. In many cases it is necessary to wash the patient's mouth frequently with some antiseptic wash. This should only be done on the expressed instructions of the doctor.

CHAPTER XIV

EMERGENCIES AND ACCIDENTS

Few things are of greater importance, and nothing is more neglected than instructing school-children how to act in emergencies. Particularly is such knowledge of value in the country. In cities the need of understanding matters of this kind is not so great, since it is usually possible to secure at short notice some one capable of dealing with any situation that may arise. Children very quickly grasp knowledge of this character, and opportunities frequently offer for an actual demonstration of the proper remedies in the case of accidents. When the instructor speaks of cuts and burns they at once understand what is meant.

The most serious result of our neglect in this particular is that our children pass through life with the most meagre knowledge of the proper way in which to meet accidents of all sorts, for where they are not taught during

their school days they, for the most part, remain ignorant of matters of this kind throughout their maturer years. It is much to be hoped —though this is somewhat of a digression— that the old unscientific and senseless system of teaching, which persists even in the present time to a considerable degree, may in the future give way to a more rational and practical plan of instruction—one that will deal with perceptible needs rather than abstractions.

The most common emergencies will now be taken up and considered in detail.

Drowning.—The subject of drowning is one of especial interest in rural districts, since it is here that accidents of this kind are most apt to occur, and skilled attention is most difficult to obtain. It is of the utmost importance to remember that people may be resuscitated after having been under the water for considerable periods of time, and we should, therefore, look upon no ordinary cases as hopeless until the proper restorative measures have failed.

On removing the body from the water we should not waste time by attempting to drain the water from the victim's mouth, as the

amount of this substance that enters the air-passages under such circumstances is so trifling that it may be entirely disregarded. The drowned person should be placed face down upon the ground with the head slightly turned to the left, and we should begin at once with artificial respiration.

Artificial Respiration.—This is accomplished by the operator kneeling between the separated legs of the patient and placing his hands on the small of his back, the thumbs nearly meeting at the middle of the spine, and the other fingers spread out over the lower portion of the chest; the operator then sways his body downward and forward slowly, counting three during the movement, then quickly swinging backward releasing the pressure on the patient's chest; again count three and repeat the original movement. The pressure should be brought to bear from twelve to fourteen times a minute, and the movement should be kept up until the patient begins to show evidences of being restored, or until it is quite evident that life is extinct.

This system of artificial respiration was originated by Professor Schafer, as the head of a

commission appointed by the British Government, and is now universally regarded as being by far the most satisfactory of all such methods.

In the accompanying figures are shown the positions assumed by the patient and operator while carrying on artificial respiration.

It should be remembered that the victims of accidents of this kind suffer considerably from lowering of the temperature of the body as a consequence of the long exposure to water, and we should, therefore, also direct our attention toward bringing about an immediate reaction by means of warm blankets and hot bottles, and by vigorous rubbing of the patient's body.

Danger from Wounds.—Wounds may be produced by a great variety of objects, but chiefly, of course, by cutting instruments. Where they are caused by duller objects, producing more or less tearing and bruising of the tissues, they are more apt to be followed by infection with disease-producing germs than where smoothly cut, and consequently require greater care in treatment. Germs sufficient to produce death may be introduced into the body by the most minute wound; it is for example well known

that fatal consequences have resulted from the bites of various insects, and the writer has personally seen a case where a pin-prick was followed by lockjaw and death. Such facts teach us that we should be careful in avoiding wounds of all kinds, and, that after they have been received, they deserve attention, however insignificant they may appear to be.

Wounds resulting from objects more or less covered with dirt are particularly dangerous, since under such circumstances the germs of lockjaw are apt to be introduced into the body, and fatal consequences not uncommonly ensue. It is astonishing how frequently the disease just referred to follows where a bare-footed child sticks a dirty splinter or a rusty nail into its foot, and it cannot be too strongly urged that it is the duty of the parent in such instances to call in a competent physician at once. The reason that injuries of this kind are so apt to be followed by lockjaw is that the germ that produces the disease lives practically everywhere in the earth—being especially common in the rich soil of gardens and other highly fertilized earths; and the germs are so minute that thousands of them might be present on the point of a pin without being visible to the naked eye. The bacilli of lockjaw do not grow at all where exposed freely to the oxygen of the air, and as a consequence of this fact we rarely see the disease that they produce developing after slight

superficial wounds; much more commonly the malady results from a wound made by some penetrating object, such as a splinter of wood, a nail, or a pin.

The lesson that these facts teach is that where wounds are small and deep it is the part of wisdom to cut them open freely in order that they may be cleansed as far as is possible, and at the same time allow the air to obtain free access to their deepest portions; a wound of this kind should not be sewn up, but should be left open and allowed gradually to heal up.

The reason why lockjaw so frequently follows wounds from the premature explosion of fireworks is that the paper used in fire crackers, etc., often contains the germs of the disease and is driven deeply into the tissues. In view of the very considerable mortality that yearly occurs among the children of this country it seems incomprehensible that our legislatures—which commonly exhibit such an uncontrollable desire to regulate their neighbors in every possible way—should not long ago have placed the ban on fireworks of all kinds.

Treatment of Wounds.—The treatment of wounds necessarily depends to a considerable extent on their character and general severity: there are certain practices, however, that apply in all cases, and should, therefore, be resorted to wherever injuries of this kind occur. Where the wound is superficial the bleeding is as a

rule trifling in character, and very quickly stops of its own accord. In other cases, particularly where deep, larger blood-vessels may be severed, and if they be of any considerable size, the hemorrhage will not cease until the subject becomes exceedingly weak, and in some instances the bleeding will go on until death results. Where bleeding is profuse, it may generally be assumed that one of the larger vessels has been cut, and under such circumstances it should be compressed until skilled assistance arrives. There is a popular but very erroneous impression that arteries can only be stopped by tying; as a matter of fact any one possesses sufficient strength in the fingers to pinch them enough to stop the hemorrhage. If possible, the operator should get his finger down into the wound, after which he can quickly discover the exact point where pressure stops the bleeding. One who is unaccustomed to surgical practices would, of course, hesitate at doing this, but it cannot be too strongly urged that a procedure of this character produces little or no pain after the finger in first introduced, and that no one should be deterred by foolish squeamishness

from immediately doing that which in many instances can only save the life of the victim.

Where arteries are evidently bleeding—which may be inferred from the spurting character of the hemorrhage—a tight bandage above the seat of the wound, if on one of the extremities, will often be followed by a cessation of the bleeding, and where only small vessels are cut, a bandage tightly applied over the wound itself may accomplish a similar result. Under such circumstances the reader should be warned that it is not safe to leave a limb tightly bandaged in this way for any considerable length of time, as complete death of the part below may result. Where then a ligature is placed above or over a wound, it should be loosened cautiously every twenty or thirty minutes, and should be left off for a time. If the wounded artery begins to bleed, one should resort to local pressure upon it with the finger for five or ten minutes, after which the bandage may again be applied.

As soon as all bleeding has ceased, the wound should be thoroughly washed out by means of water that has been boiled and allowed to cool; the operation may be greatly assisted by using a rag or a piece of cotton that was boiled in the water. If there be grease or other dirt that does not readily come away soap may be freely used.

After the wound has been thoroughly cleansed, some sort of antiseptic had better be applied. Unquestionably the best of all of these is tincture of iodine, a small amount of which should be poured directly into the wound. A saturated solution of carbolic acid in water is also a fairly good disinfectant, and may be employed where the tincture of iodine cannot be obtained. A solution of corrosive sublimate in water—one part of the former to one thousand parts of the latter—is much used as an antiseptic by surgeons, but when placed directly in wounds has a tendency to cause much irritation, and is by no means so efficient as either of the disinfectants just referred to. In the country it is an old custom to use turpentine, or resins from several different species of pines; these are fairly efficient antiseptics, and should be employed where it is impossible to obtain those that are better. It should always be remembered that thorough washing out with boiled water and soap is in itself a procedure that will remove a considerable proportion of any germs that may have got into

the wound, and that if carefully done, it is almost as efficient as the best antiseptic.

After the wound has been thoroughly cleansed by water and antiseptics, it should then be bandaged with a cloth that has been previously boiled and dried, if no regular surgical dressing is at hand. Every precaution should then be taken to prevent it being reopened. Collodion is sometimes used over small wounds, and is quite efficient in that it forms a coating over any surface upon which it is placed that is impermeable to both air and water. Small wounds that have been thoroughly cleansed and disinfected with tincture of iodine may be safely and satisfactorily closed by means of the substance just mentioned, but it should never be forgotten that the germ of lockjaw—which is the one, ordinarily, most to be dreaded in such injuries—lives and grows best in the absence of the oxygen of the air, and that a covering of collodion would materially assist in the development of this dreadful disease.

In those instances where pus forms in wounds, they should be at once reopened and

allowed to drain. It very often follows after cuts—particularly if they be not properly cleansed—that a scab forms on the outside, holding beneath a greater or less amount of pus. The presence of the latter can generally be inferred by a wound presenting a red and angry appearance around its edges, and from swelling and pain. As soon as such a condition is observed, the scab should be thoroughly soaked in water and removed, and it is then necessary that the wound be kept open and allowed to drain freely until it heals up from the bottom. A failure to observe precautions of this kind may result in blood-poisoning, and finally even in death. After a wound begins to suppurate it does little good to put antiseptics into it, as they cause considerable irritation, and under no circumstances do they put an end to the pus formation. Open drainage of the wound, and keeping up the general health of the patient, are the only means that we possess of successfully combating conditions of this kind.

Inasmuch as we possess an antitoxin that unquestionably has the power of preventing lockjaw, if given sufficiently early, it is the part of

wisdom to administer at once a sufficient dose of this substance to any child who has received a penetrating wound from some dirty object, or from the explosion of fire-crackers. Statistics show that under such circumstances lockjaw may be prevented in almost all cases. If we wait until the disease develops, the antitoxin is of no value.

Care of Sprains.—The seriousness of sprains is very generally underestimated, and as a consequence many persons go through life with ankles that are abnormally weak, and even painful in bad weather, and in which there is a tendency to swell and become exceedingly troublesome after a slight wrench. In all true sprains there is more or less actual tearing of the ligaments that bind the joint together, and, if the injury be not properly treated and the joint thoroughly supported, complete recovery in many instances never takes place.

As soon as a sprain occurs the injured joint should be immersed in water just as warm as can be borne, and hot water should be from time to time added in order to keep the temperature sufficiently high. The bath should be con-

tinued for several hours—the longer the better. Thus the pain and swelling will be greatly reduced, and the tenderness which, in the beginning, is so excruciating, will largely disappear. The next step is to properly support the injured parts in order that unnecessary movement may be prevented, thus avoiding further tearing of the ligaments. This may be accomplished by means of various splints—the most popular being those made of plaster of Paris, or silicate of sodium, either of which will require the services of a physician in order to have them properly applied.

Within recent years a treatment has come much into vogue, which is exceedingly satisfactory, and has the advantage that it does not require the service of an expert in order to have it properly carried out. This consists in the application of strips of adhesive plaster to the skin over the seat of the injury and for some distance both above and below the joint affected. Ordinary sticking-plaster is not the best for this purpose, though in an emergency it might be used; much better is the so-called mole-skin plaster, which is much thicker, and does not require moistening before being applied. The plaster should be torn into strips about three-fourths of an inch wide and twelve to eighteen inches long. Where the

ankle is the seat of the trouble, a strip is firmly applied to the back of the foot, beginning just behind the toes, and is brought around the ankle and carried up on to the calf of the leg—thus partially winding the plaster around the leg. The first strip having been applied, another is put on in a similar way, the edges of the latter overlapping those of the former. This is continued until one side of the ankle is fairly well covered, after which we may begin operations on the opposite side, carrying the strips around the leg in such a way as to meet and overlap those first put on. This process is continued until the entire joint is completely covered with the plaster. It is of the utmost importance that the foot be put in a natural position before we begin to apply the plaster, as, otherwise, it will be left in a constrained and uncomfortable position, which will do away largely with the good effects of the splint. Where carried out in the proper way it is in the highest degree astonishing to see how perfectly the joint is supported, with the effect that the use of the injured limb may be immediately resumed. The writer recalls having seen a young lady with a frightful sprain, who could not bear to touch her foot to the floor, improve to such an extent under the treatment as outlined that she was able to go to a ball and dance through the evening on the day the injury occurred.

Not only does the immediate resuming of the use of an injured limb, when treated in this

way, appear not to be injurious, but the ultimate recovery seems actually hastened. After a day or so it is well to remove the plaster splint first applied and put on another, as the former has by this time usually ceased to fit the injured joint—owing to the diminution in the swelling. The splint may be changed three, four, or even five times, if deemed necessary, though two or three applications generally amply suffice. *This or some other splint should be kept on the injured joint for at least a month or six weeks, as otherwise complete recovery frequently fails to occur, with the permanent weakening of the joint as a consequence.*

Of course it is always desirable to have a physician apply the splints for a sprain where this is feasible, but with a little care it may be done by any intelligent person who will observe closely the directions given. The plaster should be put on moderately tight, but the utmost care must be exercised in not carrying this to an extreme, as in such cases serious results might ensue. In order that it may be determined as to whether or not the splint is too tight, it is advisable to watch the patient's toes

for some hours after the plaster is put on, and should they be found to be very cold, and particularly should they begin to show a dusky discoloration, it is evidence that the strips are exerting too much pressure, and they should be at once removed. Under such circumstances, in a half an hour or so, the splint could be reapplied with safety.

The mole-skin plaster, which is used in making the splint just referred to, may be obtained in rolls of any width from all druggists; and as the plaster keeps practically indefinitely, it should be in the medicine-closet of everyone living at a distance from skilled medical aid.

After a sprained ankle the patient should wear shoes that come well up above the injured joint, and they should be laced tightly until some time after all symptoms of trouble have disappeared; it would be on the safe side to wear shoes of this kind from six months to a year, depending upon the severity of the injury.

Treating Bruises.—Bruises are not usually followed by serious consequences if properly treated. They result from injuries that tear

the tissues beneath the skin to such a degree that hemorrhage from many minute blood-vessels occurs in the injured part. In the course of a few hours they often present a truly alarming appearance, being swollen and greatly discolored, but they are not as a rule followed by any permanent ill results. Where bruises are slight no treatment of any kind is required, as in a short time the effused blood is absorbed, and the part returns to a normal condition. Where more severe it is not a bad practice to cover them with flannels wrung out from hot water, the same being renewed from time to time, and the applications kept up for from six to twelve hours. Usually at the end of this time the soreness and swelling will have considerably abated, and the injured tissues quickly return to a normal condition.

The reader should be warned that under no circumstances should the skin be opened, even though it may be quite obvious that there is a bluish mass of blood immediately beneath. Where this mistake is made, infection of the injured tissues with the germs that produce pus inevitably results, and as a consequence the pa-

tient suffers with a discharging wound for a considerable period of time. In rare cases germs get into the injured parts without the skin having been opened, and there results under such circumstances a condition which closely resembles that of an ordinary abscess. The probability that this undesirable complication has arisen is shown by the swelling becoming greater and more painful some days after the injury has occurred, and under such circumstances a good physician should be at once consulted, as it will be necessary to make an incision into the diseased area.

Soothing Burns.—One of the most common and painful of injuries are burns. Small superficial burns require no particular treatment. Where, however, they are of sufficient severity to merit attention, the simplest and best of all treatments is to immerse the diseased part in cold water, and here it should remain at least some hours, or until competent medical aid can be secured. Medical treatment of injuries of this kind is not particularly satisfactory, though there are some drugs that may be used with more or less benefit. Chief among them is

picric acid, which may be applied by means of a cloth wrung out of a one per cent. solution of this substance in water. Another treatment which has some merit, and which has long enjoyed a certain vogue among both medical men and the laity, is a combination of equal parts of lime-water with either olive or linseed oil; this is called carron oil and is applied in the same way as the picric acid solution. All three of the remedies referred to act largely by preventing the access of air to the burned surface, and they, therefore, may be replaced by any bland and non-poisonous substance which accomplishes like results.

Accidents from Heat and Cold.—The climate of the United States is characterized by extreme variations—there being over almost its entire extent during the winter months a series of "cold waves," during which excessively low temperatures are often experienced,—particularly in the northern and western portions of the country. During the summer, on the other hand, we have almost everywhere periods during which the temperature goes very high—often accompanied by excessive atmospheric

moisture. As a consequence of these extremes in temperature it could only be expected that we would often experience bad effects, so that serious illness, and even death, occasionally result.

Of the two extremes, excessive heat is much the more dangerous, and is by far more frequently followed by fatal results—particularly in crowded cities. Fortunately for the dwellers in rural districts the precise conditions under which excessive heat is followed by serious consequences are not so frequently encountered as in the more populous centers, and as a result we find that serious ill effects from high temperatures are by no means so common in the former as in the latter. There are, however, two quite well defined and distinct morbid conditions that are the result of high temperatures, and inasmuch as they differ in their symptoms as well as in their treatment, it will be necessary to consider them separately.

Sunstroke.—Sunstroke is characterized by a rapid onset, the patient usually complaining of an uncomfortable sense of burning heat and a feeling of dizziness and depression. Nausea,

vomiting, and diarrhœa are common, frequently an intense headache, and sooner or later a muttering delirium. The patient's skin is dry and hot, the face is flushed, and the eyes suffused, and a thermometer will show a bodily temperature of from 105° to 110° or even 112° F. In fatal cases it is usually some hours before the patient dies, though sometimes he succumbs almost instantly.

When attacked, the patient should at once be removed to some shady place, and should be held in a sitting posture against any suitable object that may be at hand. The clothing should be loosened at once, and every endeavor should be directed towards lowering the temperature of the victim. This is best done by pouring ice-water or the coolest water that can be secured freely over the entire body of the patient. This treatment should be continued until the temperature approaches the normal—the vigor of the measure employed gradually decreasing, as the patient shows signs of getting better. Improvement is shown by a gradual return of consciousness.

Heat-Prostration.—Like true sunstroke, heat-

prostration comes on with an extreme suddenness. The patient becomes suddenly dizzy, and sinks to the ground in a state of collapse. The skin is pale and cool, the pulse limp and weak, and the thermometer shows the temperature to be somewhat below normal. The patient should be laid on the ground in a cool, shady place, and stimulants at once given. By far the most efficient of them is a hypodermatic injection of morphine and atropine, to which strychnine in appropriate doses may be added.

Guarding against Sunstroke and Heat-Prostration.—Excessive heat is the basis of both of these conditions, but there are many contributing causes which play a more or less important part in their production. Notwithstanding the fact that they are regarded as being different, and that the treatment and symptoms of the two conditions vary widely, there can be no doubt that certain depressing influences, in every way similar, play an important part in their causation.

Foremost among such influences alcohol claims first place, and unquestionably not only predisposes to all diseases brought on by heat, but lends much

greater gravity to an attack—the drunkard rarely recovering from true sunstroke, and frequently dying from the much less dangerous heat-prostration. It is said that the latter condition is particularly prone to occur after freely indulging in beer or other malt liquors. Not only does alcohol predispose to these morbid states, but other influences that depress the general vitality are more or less apt to predispose to the production of both, such as loss of sleep, overwork, worry, excessive eating, and insufficient food. The danger is greater when there is excessive moisture in the air, so that at such times we should particularly avoid excesses of all kinds, and as far as possible, keep out of the direct rays of the sun.

Frost-bite.—In the extreme northern and northwestern portions of the United States frost-bite is not uncommon in winter. The part attacked becomes suddenly bloodless, presenting much the appearance of the skin after death. The victim is usually not aware of the fact as at first there is no pain. As soon as a condition of this kind is observed,—and in cold countries persons are quick to inform the victim when they notice it,—the place should be vigorously rubbed with a piece of ice, or with a handful of snow, and this should be continued until the circulation again returns as evidenced

by the parts becoming reddened. A rapid warming of the affected parts is not advisable, the result being not unlike that of a burn.

Chilblains.—Many persons suffer during the winter from chilblains—this being a state in which more or less pain and itching is produced in a part as the result of poor circulation. Such a condition is usually the result of a combination of cold with the affected part being more or less compressed, and as a consequence, we find that troubles of this kind are more frequently in the feet—particularly where tight shoes are worn. The remedy for troubles of this character is to wear loose-fitting shoes, and to thoroughly protect the parts by appropriate woolen socks. It is particularly of importance to change the socks often, since as soon as they become moistened with perspiration a tendency to a recurrence of the trouble is very great. Drugs are of no particular use in conditions of this kind. Chilblains are more commonly suffered in Europe than in America. One young American lady in Paris acquired them one winter, and "knowing no better," as she told the writer, cured herself by "boiling

the chilblains''—soaking her feet in the hottest water she could endure. The affliction did not return; and the novel recipe was delightedly followed by all the art-students of the neighborhood.

Blisters.—Small blisters on the feet are not uncommon as the result of wearing tight, or ill-fitting shoes. Wherever possible, they should be quickly relieved from all compression, and should under no circumstances be opened.

The treatment is very simple and quite efficient, provided it be instituted while the skin is still intact, and consists simply in placing over the affected area a small piece of mole-skin plaster, which should extend for a short distance out on the normal skin surrounding the blister; the same sort of plaster should here be used as was recommended for supporting sprained joints, and is an article so useful that it should be kept in every house. Where blisters have ruptured, the better plan is to apply some antiseptic, like tincture of iodine, and after having allowed it to dry, stick on some plaster as already directed. If no antiseptic be at hand the plaster should be used any way, but it should be frequently removed in order to see that no suppuration is occurring beneath. Small blisters, the result of burns, may be treated in a similar way with good results.

Tooth-ache.—Tooth-ache is a condition for which there is no excuse in the present state of knowledge. As soon as decay begins in a tooth it should receive the attention of a competent dentist, and where this is done a true tooth-ache never occurs. Where one has been so neglectful as to permit the exposure of the nerve of a tooth, he can only be saved from much suffering by going at once to a dentist. In the meantime, various measures may be adopted to diminish the pain. A piece of cotton dipped in dilute carbolic acid and thrust into the cavity will almost immediately relieve the suffering for the time being. Oil of cloves, or a mixture of this substance with chloroform, applied in a similar way will bring about a like result. The reader cannot be too often reminded of the fact that bad teeth not only cause much suffering, but likewise lead to many digestive disturbances, and as a consequence little could be of more importance to the health of the body than to see to it that they be kept in perfect order. Where teeth are knocked out, they will often grow back and render good service for

many years afterwards if replaced immediately in their sockets.

Bites of Animals.—Wounds of this character, particularly those produced by dogs and cats, are not at all uncommon. Where it is definitely known that the animal is not rabid, the treatment should be that of punctured wounds, —to the chapter on which the reader is referred for further information.

Where there is reason to suspect that the animal has hydrophobia, it should be, if possible, at once confined, and watched for developments. Under no circumstances should it be killed. If the animal is rabid, it will be unable to eat or drink, and will die in the course of a few days; should it survive not the least fear need be felt as to it having had hydrophobia, as no instance is on record where the disease was followed by recovery. For further information on this subject, the reader is referred to the special article on hydrophobia (page 211).

Hiccough.—Hiccough is a condition caused by a spasm of the diaphragm. All methods for the relief of this somewhat annoying condition

are based upon the idea of having the patient hold his breath as long as is possible. The remedy is best applied by the sufferer holding his breath and leaning as far backward as is possible, and in the meanwhile distracting the attention by pointing the index finger of one hand towards the nose, and bringing the former toward the latter as slowly as is possible. Sticking the tongue out and holding the breath at the same time will often relieve hiccough, or if the victim can be induced to sneeze the distressing symptom will at once cease. The *slow* swallowing of a few sips of water will frequently put an end to the trouble.

CHAPTER XV

WHAT TO DO WHEN POISONED

The vast majority of cases of poisoning occur in children, and are, almost without exception, due to carelessness of their elders, and therefore preventable.

As soon as it is recognized that anyone has swallowed a poison of any kind, a competent physician should be summoned with the utmost haste, and in the meantime much may be done, in most cases, to minimize the effects of the substance taken. The patient should at once be urged to drink as much water as is possible, in order that the poison may be diluted, and every effort should be made to induce vomiting; this may often be brought about as soon as the stomach is full of water, by tickling the throat with the finger, or with any other object that can be readily introduced through the mouth. As quickly as possible, some warm water

should be secured, to a quart of which either a teaspoon of salt or mustard should be added, and the patient urged to drink until the stomach is thoroughly distended; following this, particularly where aided by tickling the throat, vomiting may be generally induced, with the effect, of course, of expelling a greater or less proportion of the poison from the stomach. If it be known that the poison is an *acid,* ordinary cooking soda should be added to the water that the patient drinks, as in this way all acid substances are at once neutralized.

If the patient has taken an *alkaline* poison, he should immediately be given diluted vinegar, or water into which the juice of lemons or oranges has been squeezed; such harmless acids neutralize poisonous alkaloids just as harmless alkalies antidote poisonous acids.

Arsenic poisoning usually results from the accidental swallowing of rat-poison or some insecticide, as Paris green, or else some sort of green dye, many of which contain salts of arsenic in some form. An emetic should be at once given, to be followed by the whites of several eggs dissolved in a small amount of water;

sweet milk may also be administered with benefit.

Accidental poisoning by *phosphorus,* results usually from children eating the heads of matches, and it is rarely the case that enough of the substance is taken to produce serious results. The poison, however, is a deadly one if taken in sufficient quantity, and where it is found that substances containing it have been swallowed the most energetic measures should at once be resorted to. Warm water containing mustard or some other emetic should at once be given, and this should be followed by whites of eggs and sweet milk. It is well also to try to get rid of any of the phosphorus that might remain in the stomach by giving the patient some saline purgative like Epsom salts.

Where *carbolic acid* has been taken, the fact can be readily determined by noting the characteristic smell of this substance on the patient's breath, and by observing that the mouth and throat present a more or less whitish appearance. The treatment to be of any avail, should be of the most energetic character. The patient should at once drink largely of water,

and vomiting should be induced as quickly as possible. Either milk or the white of an egg should then be given. Ordinary quick-lime, or even plaster from the walls of the house, may be stirred up in water and administered to the sufferer, as both have a distinct value in antidoting the effects of this poison. Burns of the skin with carbolic acid are rarely followed by serious consequences. As soon as the accident occurs the part should be thoroughly washed with water, and if at hand a little alcohol may be rubbed over the part; the affected tissues return to a normal condition in the course of a short time in the vast majority of cases.

Strychnine poisoning is comparatively rare, except when this substance is given with suicidal or murderous intent. Water should be given, immediately followed by an emetic. A mass of crystals of permanganate of potash as big as a pea may be administered in a glass of water, if this substance be at hand. After the poison has been absorbed nothing is usually of any avail if the amount was originally sufficient to produce death.

One of the commonest forms of poisoning is

from *opium* in the form of morphine, paregoric or laudanum. When this happens the stomach should be washed out by water frequently, even where the drug was administered hypodermatically. This is best accomplished by causing vomiting by warm water to which a small amount of mustard has been added. The patient should be given strong coffee or tea at frequent intervals, and artificial respiration should be practiced. Where it is possible to obtain it, permanganate of potash in a watery solution should be given, enough of the chemical being used to make the water a deep purple color; this may be frequently repeated, as the substance is not poisonous in ordinary doses, and destroys morphine and other alkaloids of opium very rapidly.

It should never be forgotten that infants and children are poisoned by comparatively very small doses of opium, and consequently nothing containing any derivative of this substance should be given them except on the advice of a competent doctor.

Many soothing syrups advertised for the relief of the minor ailments of children contain

opium, and there can be no doubt that many deaths have occurred as a consequence of taking such nostrums.

Mushroom poisoning in this country is relatively rare, but there are quite a number of popular notions on this subject that are totally incorrect, chief among which is the idea that there is a difference between mushrooms and toad-stools, the former being generally regarded as edible, and the latter poisonous. As a matter of fact, those conversant with this subject make no distinction between the two, using the terms toad-stool and mushroom as interchangeable. It is likewise a common error to suppose that we possess any tests by which the poisonous toad-stools can be told from those that are wholesome. Although a skilled student of the subject can almost at a glance determine which are poisonous and which are not, it is hazardous in the extreme to consume those selected by one who is inexperienced. As a matter of fact, for all practicable purposes, there is only one species that is generally eaten,—the *Agaricus campestris,* or meadow mushroom. This grows for the most

part in open fields, and in many parts of the world may be gathered in great number throughout the warmer seasons immediately following rains. This mushroom has also the great advantage that it is the only one of the edible species that can be cultivated.

Just as we have only one common mushroom that is ordinarily eaten, there is only one common species of these plants that is highly dangerous,—the *Amanita phalloides,* which contains one of the most deadly poisons known—and one for which we possess no adequate antidote. This mushroom is very common, being frequently seen along the roadside, and at the edges of fields; it also grows in forests, and is occasionally encountered in treeless areas.

It presents a rather attractive appearance, being rather large, and having a glistening white cap with a long stem, around which there may always be seen a distinct collar; on carefully removing the soil from around its roots, it will be seen that its stem is surrounded just below the surface of the earth by a sheath-like structure, the so-called "death-cup," which, together with the peculiarities already mentioned, clearly stamp this mushroom as being one of the most deadly of all known natural objects. In addition to the rather inviting appearance of this

toad-stool, its flavor is agreeable, thus in every way insidiously inviting, it would seem, the unwary to their doom. Less common than the species just considered is another closely related fungus known as the *Amanita muscarius,* or fly-agaric; this handsome mushroom presents the same peculiarities of structure exhibited by the *Amanita phalloides,* but differs from it in the fact that the tip of its cap is scaly, and is of a reddish-yellow color. The fly-agaric is quite as poisonous as its more common relative, and is equally to be shunned. The reader should be warned that even handling either of the fungi just considered may result in poisonous symptoms—probably as a consequence of multitudes of the tiny spores of the plants being carried into the nose and mouth by the air.

Some hours after eating the *Amanitas,* the patient is taken with vomiting, diarrhœa, cramps, and extreme prostration; in children, convulsions may occur. Most unfortunately evidences of this poisoning do not usually develop until some hours after eating it. As a consequence, a considerable amount of the poison has usually been absorbed into the body before the victim is aware that anything is wrong, and it, therefore, becomes impossible, as a rule, to greatly help matters by attempting to remove the offending material from the stomach

by emetics. Notwithstanding this it would be proper to administer warm water, into which a small amount of mustard had been stirred, in order to assist nature by washing out of the stomach whatever portions of the fungus might remain. When exhaustion begins to appear, it should be combated with doses of aromatic spirits of ammonia, and by the external application of heat. As it is believed that atropine possesses some antidotal powers to the poison of the *Amanitas,* this substance should be injected hypodermatically in the usual dose as quickly as possible, and an experienced physician should be called at once.

Ivy Poisoning from Touch.—One of the two species of *Rhus,* is exceedingly common in all portions of the United States, producing a severe inflammation of the skin when handled, or even in some persons by merely being near the plants or in the smoke of a fire where they are burning. There are two varieties of the *Rhus toxicodendron,* one being the shrub commonly called *poison oak,* and the other a climbing vine generally known by the name of *poison ivy.* The *Rhus venenata* grows in swampy lo-

calities all over the United States, and is known as poison-sumach, swamp dog-wood, poison-elder, and poison dog-wood. About twenty-four to forty-eight hours after the exposure, the skin begins to itch, and this is shortly followed by an inflammation accompanied by the formation of numerous small blisters, and still later by scaling. It should not be forgotten that the berries and other portions of these plants are poisonous when taken internally, giving rise under such circumstances to vertigo, faintness, dilation of the pupils, trembling, confusion of the senses, and, in some instances, convulsions. Should it be discovered that anyone has been exposed to poisoning by these plants, the skin should be washed as quickly as is possible with alcohol, or some substance like whisky that contains it; where this cannot be obtained, hot water and soap should be liberally applied—the object, in either case, being the removal of as much of the poison as is possible. After the irritation of the skin has begun, the parts may be bathed in a one per cent. solution of carbolic acid, to be repeated every few hours, as the necessities of the case

may demand. Lead-water is also frequently used with benefit, lime-water also appears to be of use, but the various powders and salves sold in stores rarely help the patient much. The best thing after all is soap and water as hot as it can be borne; and ordinarily the itching and inflammation will disappear in four or five days, followed by scaling.

VENOMOUS SNAKES AND SNAKE BITES.

Much popular misapprehension exists on the subject of snakes, both as to the results of their bites and the appropriate treatment under such circumstances. It is not generally understood that a very large percentage of our American snakes are entirely harmless—the poisonous ones being decidedly more the exception than the rule.

Within the confines of the United States there exist only two families of venomous serpents. By far the most numerous are three genera of viperine snakes, including the rattlesnakes and moccasins; all of these have a pit-like depression between the nose and eyes, and hence are called *pit-vipers*. In the southern portion of

our country there are two species of a colubrine genus closely related to the dreaded cobra of the East, one of them being called the coral-snake or harlequin snake, and the other, which occurs in the southwest, is known as the Sonoran coral-snake.

While there are three genera of vipers in America, two of them are so closely related, and present characteristics that are so similar that the ordinary observer would regard them as being identical, and inasmuch as the character of their poison seems in every way similar, for practical purposes it would seem desirable to include them under one head; in both genera, the species have rattles on the tips of their tails, the more common being the ordinary rattlesnakes (genus *Crotalus*), of which there are twelve species in the United States, and the ground-rattlesnakes (genus *Sistrurus*), of which there are two species.

Closely related to the rattlesnakes are the true moccasins, of which there are two species, one being the cotton-mouth or water-moccasin (*Ancistrodon piscivorus*), and the other the

highland moccasin, pilot-snake or copper-head, (*Ancistrodon contortrix*).

The two species of poisonous colubrine serpents already referred to are known respectively as the *Elaps fulvius,* and the *Elaps eury-xanthus,* both of which occur in the southern portions of the United States. These snakes are fortunately of a very mild disposition, and rarely attempt to bite, even when handled. That their poison is exceedingly deadly is attested by the fact that out of eight instances where it was known that persons were bitten by them, six died, and they should, therefore, be looked upon as among the most deadly of North American serpents. Mention should be made of the fact that there are at least six harmless reptiles that resemble the coral-snakes very closely, and as a consequence of the former being mistaken for the latter, the assertion has been frequently made by the ignorant that our elapine serpents are harmless.

A short description of the really deadly reptiles encountered in this country that would enable even the novice to distinguish them from

those that are harmless would seem not inappropriate here, for where a person is bitten by a snake it becomes at once a matter of vital importance to determine, if possible, its true character. Most non-venomous serpents will viciously bite when cornered, and while they may produce slight wounds, with a small amount of bleeding, such injuries are entirely devoid of danger, and need occasion no fear on the part of the victim. There now follows a brief description of our venomous snakes, by means of which it will be easy for any one to distinguish them from their innocent relatives.

True Rattlesnakes.—There are twelve species of these reptiles in the United States, all of which, with but two exceptions, live west of the Mississippi. They vary very greatly in color, but the common eastern forms generally have alternate transverse yellow and brownish-black marks over their bodies. All possess rattles. The body of the snake is thick is proportion to its length, and the head, which is more or less diamond-shaped, is much larger than, and is quite distinct from the neck. The pupils of the eye are elliptical—a peculiarity which

the pit-vipers alone possess of all the North American snakes. Between the eye and nose there is a comparatively deep depression or pit which gives to this group of snakes their name. There are two large, exceedingly sharp fangs in the front of the mouth, in the position of a dog's canine teeth, that are folded up against the roof of the mouth when the snake is in repose;—being brought forward in a position for stabbing as the serpent strikes. The scales on the under surface of the body back of the anus do not divide along the middle line into two rows, as in harmless snakes.

Ground Rattlesnakes.—There are two species of the pygmy or ground-rattlesnakes. They attain to a length of only about twenty inches, and present the general characteristics of the true rattlesnakes, with the exception that the rattle is small, consisting of but one single button at the end of the tail. These serpents are exceedingly vicious, and usually bite without warning. Contrary to the general opinion, however, the wounds they inflict are rarely, or never, followed by serious consequences in man. One species is southern. The other occurs from

Ohio to Nebraska, where it is called massasauga.

Cotton-Mouth Moccasin.—The largest specimens of the cotton-mouth moccasin attain to a length of about six feet. The full grown reptile is of a dingy brownish-black color, but the young are pinkish, with coppery bands running transversely across the body. With the exception that this reptile has no rattles, it answers in its general peculiarities to the description already given of its near relatives the rattlesnakes. The cotton-mouth moccasin is semi-aquatic, being found around the edges of streams and other bodies of water.

The Copper-head, or Highland Moccasin.—This serpent is found from Florida and Illinois to southern Massachusetts; also in parts of Texas. The largest specimens have a length of about three feet. They resemble the cotton-mouth moccasin in their general peculiarities, being, however, somewhat lighter in color. The head has a coppery tinge, from which the snake gets its name, while the body is of a brownish color, with transverse Y-shaped bands of reddish-brown. Its favorite habitat is rocky hill-

sides and the banks of mountain water-courses.

Coral-snakes—The two coral-snakes resemble each other very closely, and are long slender serpents, whose heads are quite small, and scarcely differentiated from their bodies. The pupils are round, and the head has no pits. They possess two short permanently erect fangs, which are by no means so well developed as those of the viperine reptiles—though perhaps capable of inflicting more deadly wounds than any of the latter,—with the possible exception of the diamond-back rattlesnake of the extreme southern portion of the country. Their coloration is exceedingly beautiful, and when properly interpreted, entirely characteristic. From the head to the tail their skins exhibit alternate rings, or encircling bands of black, red and yellow—each band of the two former colors being bordered by yellow; *in other words there are as many yellow stripes as there are both black and red together.* Stress is laid upon the characteristics just mentioned, for the reason that half a dozen species of harmless serpents that greatly resemble them may, without excep-

tion, be differentiated from the true coral-snakes by the fact that there are as many *black bands as both red and yellow.* Where a snake has been killed, it is of course quite easy to determine whether or not it is venomous by a search for the fangs, which are never present in the non-poisonous reptiles. Fortunately, the coral-snakes are only found in the extreme southern portion of the United States, live under ground for the most part, and are rarely encountered.

Treatment of Snake-Bite.—As soon as a person has been bitten by a poisonous serpent, a tight bandage, or ligature of any kind, should be applied above the wound if the injury has been received on any of the extremities,—which is fortunately the case in the vast majority of instances. The part bitten should be at once exposed, and search made for the point of entrance of the fangs. It should be particularly noted as to whether there are one or two wounds, as it is true in about one-half of the cases that only one fang enters the flesh,—in which case, of course, the probabilities of serious consequences resulting are largely diminished. With a pocket-knife or other sharp in-

strument the wound should be enlarged, and, if possible, someone should be persuaded to suck the wound; this should not be done by one with decayed teeth, as under such circumstances the poison might be absorbed and produce unpleasant consequences. A doctor should be summoned as quickly as is possible, but it must be confessed that in the present state of knowledge, unless he should happen to possess—which he probably will not—some antitoxin for the particular snake doing the damage, his services will likely be of no great value.

It has been asserted by some that very large doses of strychnine are directly antidotal to snake venom, but more recent experience does not tend to confirm this view; still there is no harm in making the trial, and if the services of someone capable of giving the injections can be secured, the treatment is certainly worth the trial. The immediate injection into the tissues around the wound of a one-per-cent. watery solution of chromic acid or potassium permanganate is thought to be of value by destroying the poison, but in order to be efficient it must be administered within a short time after the bite has been received. Should the patient's condition become serious, and the breathing finally stop, artificial respiration may be resorted to. As soon as the reme-

dies suggested have been tried, it is time for us to go back to the ligature, which cannot be suffered to remain around the limb indefinitely, as by cutting off the blood-supply it will sooner or later produce death of the tissues. From time to time we should slowly loosen the bandage, thus allowing a little of the poison to pass into the body, and at the same time permit the entrance of a small quantity of blood into the tissues of the limb beyond the ligature; the bandage should of course be tightened at the end of a half a minute, and it should be alternately loosened and tightened every half hour until the patient is considered to be out of danger.

The reader cannot fail to have observed that nothing has been said concerning the use of alcohol in the treatment of snake-bite, and the matter is only here referred to for the purpose of condemning it as being unsound in theory and bad in practice.

The idea that this drug is of value in snake bite doubtless originally arose from the fact that those bitten by poisonous serpents were depressed, and, as in the past alcohol was considered the best of all stimulants, it is not surprising that its use was generally considered to be essential. As we now know, however, that alcohol is a depressant rather than a stimulant, and as numerous experiments carried out on animals have clearly shown that it does harm in

snake bite rather than good, there is every reason why we should cease to endanger the lives of those already poisoned by adding to the trouble by using this drug. There is but little doubt that many more persons have been killed by the alcoholic treatment for snake bites than have died from the effects of snake venom. Inasmuch as there is a deep-rooted superstition among most people that alcohol is the panacea for snake bite—and such notions die hard —it may be well to say that all of the authenticated cases of this character that have occurred in this country have recently been collected, with the result that it was shown that only about one man in ten dies who is bitten by a venomous serpent, and it is, therefore, quite easy to understand why alcohol has maintained its reputation as being an antidote in such cases—the chances being nine to one in the victim's favor without any treatment whatever.

As soon as the patient's needs are attended to, it is well to find if the snake that inflicted the wound was killed, and an examination of it should at once be made as by determining the size and character of the reptile an accurate forecast to the probable results may be made. In many instances it will be found that the snake was not venomous, it having made only a few scratches which are of no more consequence than the prick of a brier. If it be found that the ser-

pent inflicting the wound belongs to one of the groups already referred to, the probabilities of a serious result will depend upon the size and character of the snake, and also to a considerable degree on whether one or both fangs entered the victim's body. A full grown diamond-back rattlesnake, which may attain the extreme length of eight feet, is perhaps the most dangerous of all the American poisonous reptiles, though a fully grown coral-snake may be regarded as almost, if not quite as, deadly. Next to these a large sized cotton-mouth moccasin is perhaps most to be dreaded, to be followed, depending upon their size, by the other varieties of rattlesnakes, the copperheads, and finally the ground-rattler. The larger the serpent inflicting the wound the greater is the result to be dreaded; naturally it also follows that the larger the individual bitten the less the danger.

APPENDIX

RECIPES FOR COOKING COMMON FOODS

By Dr. Mary E. Lapham

PREPARATION OF MEATS

Roast Beef.—The problem of roasting beef is to have it sufficiently cooked in the center without hardening and over-cooking the outside. Burned edges and a raw center testify to a lack of intelligence.

The English way of baking beef is to allow nine minutes to the pound for a rib-roast and eight minutes for a sirloin. Sprinkle pepper and salt over the meat and sprinkle with flour. Pour a little boiling water into the pan and bake in an oven hot enough to crisp and brown peeled raw potatoes cooked in the same pan. Do not forget to baste often. This method gives a rich flavor to the beef and the gravy, but the outside is apt to be cooked too hard while the inside is not enough cooked. Too hot a fire tends to make meat tough and dry.

The French have a safer way, especially for small roasts. The beef is cooked in a cool oven—so cool that a peeled, raw potato will cook tender without browning. Allow about an hour and a quarter for a

four-pound rib-roast. In this way the heat penetrates to the center without hardening the outside. When properly done the outside is very little more cooked than the inside, and the roast throughout is tender, rare, and juicy, with no hard-burned edges. This way of baking makes inferior beef more tender and juicy than the English way. It has the disadvantage of not leaving any gravy in the pan. When baked after the English method the fat fries out into the pan, and a delicious, rich, brown gravy may be made by adding flour and water. Strain the juice through a fine sieve and allow to stand a few minutes so as to be able to skim or pour off all the grease. Do not serve gravies with half an inch of pure grease on top. It does not require a scientific education nor a herculean effort to remove the grease.

Pot Roast.—If the beef is of an inferior quality, the best way to cook it is in a heavy iron kettle, preferably with a sloping bottom. Sprinkle the meat with salt and pepper; place a little fat in the bottom of the kettle—enough to keep the meat from sticking—and allow the roast to brown slowly for half an hour. Now put a pint of boiling water in the pot. Cover very closely and let it simmer on the back of the stove for about four hours, adding small quantities of hot water as necessary, and turning often. When cooked take up the meat; skim the fat from the gravy and thicken with flour.

Hamburg Steaks.—Another way of preparing inferior cuts of beef is to make Hamburg steaks. Chop the meat in fine pieces. Season with salt, pepper and

a little onion juice, and shape into thin cakes. Put three or four slices of fat salt pork into a frying-pan, and when brown remove it and place the steaks in the fat. Fry four minutes; turn, and fry three more, and serve on a hot platter. Put a tablespoonful of flour into the fat and stir until brown. Gradually add a cupful of water or preferably milk and boil three minutes; season well, pour over the meat, and serve immediately.

Broiled Beef.—Broiling is the simplest, easiest, and most delicious method of cooking meats, but, as a rule, ignorance instinctively turns to the frying-pan, and broiling is unknown in many homes. This is partly due to not knowing how to manage the fire. It seems so much easier to fry on top of the stove than to plan beforehand an adequate preparation of the coals. It is necessary to have a bed of clear, hot coals with no smoke. Have the steak cut three-quarters of an inch thick; place in a wire broiler; put over the coals and cover with a baking-pan. Turn every minute or two until the meat is sufficiently cooked. When done, place on a hot platter, and season well with salt, pepper, and butter. Serve immediately. It should take about ten minutes to cook a steak or thick mutton chop.

Fried Beef.—If beef must be fried, have a hot fire; heat a thick iron frying-pan and grease it just enough to keep the meat from sticking. Have the meat three-quarters of an inch thick; place in the hot pan and turn as soon as it is well seared. Turn often until done and then season well and serve at once.

There should be no gravy in the pan; all the juices should be in the meat.

Beef Hash.—Take equal parts of beef and cold potatoes, chopped moderately fine. Chop a small onion and fry in plenty of butter until brown; add the meat and potatoes and just enough milk to keep from sticking. Cook for half an hour, stirring frequently. Serve with thin, dry toast or toasted crackers. Poached eggs are a very nice addition.

Veal.—Veal, when properly cooked, is delicious and delicate. Like pork it should be cooked slowly for a long time to develop its full flavor. Unfortunately it is usually half-cooked, tough, and insipid. The housewife who can cook veal properly has a distinct advantage over her less fortunate neighbor.

Leg Roast of Veal.—Take out the bone and fill the space with stuffing made as follows: Take one half-cupful of chopped fat pork, or unsmoked bacon, and fry with a finely chopped onion until delicately brown. Add two cupfuls of bread crumbs; season with salt and pepper and moisten with a little milk. Tie the veal closely; sprinkle with pepper and salt; rub thoroughly with flour and cover with buttered paper. Into the baking-pan put a generous number of thin slices of unsmoked bacon, an onion and half a can of tomatoes. Add just enough boiling water to steam the veal. Cook gently in a moderate oven, allowing twenty-five minutes to the pound, and baste very frequently, turning the meat about every half-hour. When done, put it on a hot platter in the warming oven, and add enough water to make the requisite

amount of gravy. Thicken with browned flour, strain, and pour over the roast.

Fried Veal.—Fried veal steak or cutlets are delicious, but very difficult to prepare properly. As a usual thing veal cutlets are either half raw, or cooked until dry and hard. When properly cooked veal should be spongy, soft, and velvety. The chops should be not quite a half inch thick. Melt a little lard in a hot frying-pan; sprinkle some salt and pepper on the veal and fry quickly until brown on both sides. Then cover tightly, and place on the back of the stove and steam until thoroughly tender. It requires from forty to forty-five minutes to fry veal.

Broiled Veal.—The veal should be cut thin, broiled quickly until brown, and seasoned with salt, pepper, and melted butter, to which a little chopped parsley and lemon juice have been added. Serve on a hot platter and eat at once. If the veal is fat, tender and nicely broiled, it is almost as good as game.

Veal Stew or Pot-pie.—Cut the meat from a knuckle of veal into pieces not too small; put them into a pot with some small pieces of salt pork, and plenty of pepper and salt; pour over enough hot water to cover it well, and boil until the meat is thoroughly done. While the water is still boiling drop in, by the spoonful, a batter made as follows: Two eggs well beaten, two and a half or three cupfuls of buttermilk, one even teaspoonful of soda, and flour enough to make a thick batter. Cover the pot, and as soon as the batter is well cooked serve it.

Veal Stew.—This is an exceedingly nutritious, eco-

nomical, and appetizing dish. Cut the veal into small pieces about an inch square; add three or four thin slices of salt pork; one or two onions and potatoes cut up fine, and a little turnip, carrot, parsley and celery, if you have them. Cover well with boiling water and cook over a brisk fire until the meat is tender and the water pretty well cooked away. This will require about an hour. Cover the meat well with fresh milk; season to taste with pepper, salt, and a generous quantity of butter; let the mess simmer on the back of the stove about twenty minutes, and serve it in a hot covered dish.

Jellied Veal.—Jellied veal gives the impression of an expensive preparation, and yet nothing is cheaper or simpler. Put a knuckle of veal into a pot that can be tightly covered; season well with two or three slices of unsmoked bacon, the heart of an onion, salt, pepper and a little butter, adding just enough water to steam the meat thoroughly (replenishing it from time to time as needed), and cook over a slow fire until tender—probably about four hours. When done there should be about two teacupfuls of broth. Prepare three cold hard-boiled eggs. Cut the veal into pieces the size of a walnut. Now choose a dish just large enough to hold the meat, the eggs and the broth. Slice the eggs and place a few pieces on the bottom of the dish. Now put in a layer of veal; then more egg and continue in this way until the veal is used. Strain the broth over the veal and set it away in a cool place, preferably on ice, until quite firm. When about to serve it, loosen by slipping a knife,

warmed in water, between the meat and the dish. Garnish with parsley or lettuce, and serve with salad of any kind.

Roast Pork.—Pork should be thoroughly cooked in a medium hot oven. For the leg or the shoulder allow twenty-five minutes to the pound. For the spareribs allow fifteen minutes. Sprinkle the spareribs well with salt, pepper, sage, and a little chopped onion, or bake a few onions in the same dish. Put a little water in the pan and add to it as it cooks away. The leg, the loin, and the shoulder may be stuffed with well-seasoned sage stuffing. To make this, cut a few strips of fat pork into small dice and fry over a slow fire. Add a finely chopped onion and cook until brown. Crumble as many slices of dry bread as you will need, and fry with the onion and pork over a slow fire until nicely browned. Moisten a little with milk or cream, and fill the space left by removing the bones. Sew tightly together and bake thoroughly. Peeled, raw potatoes are very nice baked in the same dish with the pork. A medium sized potato will require a little over an hour to bake in a moderate oven. Apple sauce, sauerkraut, or cabbage cooked with a little vinegar, are nice to serve with pork.

Broiled Pork.—Very thin slices cut from a leg of pork, or the cutlets, or the chops, are extremely nice and delicate when broiled. They must be cut thin; the coals must be bright and hot; and the meat turned very often. Serve on a hot platter.

Fried Pork.—For frying, pork should not be cut

over a half an inch thick: Cook slowly from forty minutes to an hour, with the pan closely covered, to keep in the steam. Pork requires a long, slow process to develop its flavor and tenderness. Nearly everyone cooks it too fast, and for too short a time. When thoroughly steamed and nicely seasoned with salt, pepper, sage and a little onion, well fed pork is as toothsome and dainty as turkey. Make a brown gravy and pour over the meat. Serve with apple sauce.

Boiled Pork.—Take a leg of pork, or a shoulder, and remove the bones. Tie closely together and let it cook slowly in a tightly covered pot for half an hour, adding a little fat if necessary to keep the meat from sticking. Now sprinkle with salt, pepper and sage. Put two whole onions in the pot, and just enough boiling water to thoroughly steam the meat. Place it on the back of the stove and cook over a slow fire for four or five hours until thoroughly tender and velvety. When done put on a hot platter in the warming-oven. Thicken the gravy with flour, adding a little water or milk if necessary, then let it boil for five minutes and strain. When properly cooked this is delicious cold, and almost as good for salad as chicken or turkey. If desired, peeled raw potatoes may be browned in the pot with the meat. These will take about an hour to cook.

Curing Ham and Bacon.—To have good ham and bacon the meat must first be properly cured so that the lean part is pink, tender and soft to the touch, while the fat is clear and white. In many country homes the lean meat is about as tough, hard, and indi-

gestible as sole leather. A good recipe for curing is as follows: For every gallon of water take two pounds of coarse salt and one-half ounce of soda. Boil all together and skim well, and, while hot, pour over the meat. Put in a cold dry place with a stone to keep the meat well below the water. After three weeks, hang the meat and let it dry for two or three days before smoking.

Broiled Ham.—Nothing is more appetizing for supper than broiled ham, served with mashed potatoes, milk toast, or a poached egg on dry toast. Cut the ham as thin as possible, and broil quickly over hot coals, turning constantly until the fat begins to shrivel. Have everything else ready so that it can be eaten immediately. Cold cabbage salad is nice with this.

Boiled Ham.—If quite salty, soak the ham twenty-four hours. Put it in a large kettle with a generous supply of water, and allow twenty-five minutes to the pound for boiling. Take the pot from the fire and let the meat remain in the water until nearly cold. Sprinkle with pepper and rub thoroughly with brown sugar; put the ham and the fat from the liquor into a baking-pan and brown for about an hour in the oven. Cut as thin as possible when serving.

Frying Ham.—Cut the ham in the thinnest possible slices, with a large, sharp knife. Have the frying-pan hot, and cook the meat just enough to give the fat a delicate brown, turning frequently. To cook ham too much is to make it tough, hard, dry, and indigestible. Put the ham on a hot platter in the warming oven.

Add a cupful, or more, of fresh milk to the grease and thicken with flour. Serve with boiled potatoes. Instead of making a gravy, eggs may be fried in the fat. To do this nicely the fat must not be burned. The eggs should be dropped in one by one, allowing them plenty of room to spread out. Cook slowly and with a spoon baste the yolks with the hot fat until they sear, being careful not to cook the egg too hard. These eggs are very nice served on thin, dry toast, or one may be placed on each slice of ham.

Fried Bacon.—Cut the bacon into very thin slices, and cook in a hot frying-pan just long enough to turn the fat to a delicate brown. If cooked too long it is hard and indigestible, besides losing its delicacy of flavor. A very nice way to cook bacon, instead of frying it, is to roll the slices up into curls, skewer them with toothpicks, and place them in a baking-pan on the grate of a hot oven until they are slightly brown. Serve on dry toast. They should be eaten at once.

Broiled Bacon.—Bacon can be broiled like ham. A very nice way to serve it, especially for an invalid, is to toast it before the fire; split a hot biscuit and make a sandwich with the bacon. Bacon toasted this way and eaten when very hot has a peculiarly appetizing flavor.

Unsmoked Bacon.—Cut in thin slices; roll in flour or meal; dust lightly with pepper; fry over a moderately hot fire until delicately brown and crisp, and put on a warm platter in the warming closet. Add sufficient fresh milk to the fat to make the requisite

amount of gravy. Season with a little salt and pepper, and thicken with flour. Do not pour over the meat. Serve in separate dish.

Boiled Mutton.—Mutton should be cooked very much like beef,—just enough to leave a faint pink, but not enough to make it hard and develop a strong taste. For boiled mutton allow ten minutes to the pound. Add a little rice to make the meat whiter and tenderer. Cover with boiling water and cook rapidly for fifteen minutes; then place on the back of the stove where it will simmer nicely for two hours. Young turnips, boiled with the mutton are a very nice addition.

Mutton Cutlets.—The chops should be thick. Grease the bottom of a hot frying-pan just enough to keep the chops from sticking; place over a hot fire, and turn the meat constantly to keep it from burning until the center is a faint pink. Season with salt, pepper, and melted butter to which a little lemon juice and parsley may be added.

Roast Mutton.—The French roast mutton in a slow oven in order that the heat may penetrate to the center without injuring the outside. Allow twenty minutes to the pound, or, if a very large roast, twenty-five minutes may not be too much, providing the oven is not too hot. Season with salt and pepper, and put a generous supply of boiling water in the pan. Baste frequently, and turn the meat every half hour. Place two or three peeled raw potatoes in the pan, and watch them; if they begin to brown, the oven is too hot. The potatoes should keep pace with the mutton, and

when the latter is half done the former should be cooked to the same degree.

Broiled Mutton Chops.—The chops should be cut an inch thick. Trim off the fat and scrape the bones. Roll in a little melted butter or oil, and broil over a hot fire, turning constantly until just pink within. Have ready a mound of hot mashed potatoes and lay the chops around it. Pour a little melted butter over them and serve with green peas.

PROPER COOKING OF CEREALS.

Starchy foods in any form must be well cooked. Gluey, slimy oatmeal, full of hard lumps of half-cooked grains, the whole forming a raw, horrid mass, is very different from the smooth, well cooked, easily digestible, oatmeal prepared by a good cook. Rolled oats are more easily cooked than oatmeal, as they are already prepared. For four people, put a quarter of a teaspoonful of salt into four cups of *hot* water and stir in slowly one cup of rolled oats, being careful not to allow lumps to form. Cook for an hour in a double boiler.

Hominy.—Hominy is seldom well cooked. It is often lumpy and raw, and yet has a burned taste which comes from being cooked in too little water, while if too much is used it goes all to soup and can never be made good. Salt a quart of boiling water, and very carefully stir into it a cup of hominy. Stir often and add a little water from time to time if it gets too dry. Cook until every grain is thoroughly done.

Rice.—Rice is rarely well prepared, the greatest trouble being to get each grain well cooked without making it mushy. When properly cooked each grain will be firm and distinct, and at the same time soft and tender. Wash half a cupful of rice thoroughly, put it in a quart of boiling salted water, and let it boil for half an hour; then drain it thoroughly and steam it in a colander for an hour.

Corn-Bread.—Corn-bread should be something like rice: every particle thoroughly cooked and soft, and yet not sticking together, so that the inside is dry and crumbly while the outside is crisp and nutty. The thinner corn-bread is baked the more perfectly it cooks. It should not be more than an inch thick and preferably less. A cannon-ball of raw meal, with only the thinnest of surfaces decently baked, is an insult to a man's intelligence as well as to his digestion. This is the way to prepare it properly. Sift a teaspoonful of baking powder into a pint of corn meal. Mix in a piece of butter the size of a walnut and add sweet milk until you get a dough that can be kneaded into a cake. Bake in a hot oven until brown and well done. A little richer corn-bread is made by heating a pint of sweet milk and pouring it over a pint of corn-meal. Melt a piece of butter the size of a walnut, beat two eggs, add a little salt, and mix well into the meal. Put in a shallow dish, and bake about a half hour in a quick oven.

Biscuits.—Biscuits should be thin, crisp, delicately browned and free from flour. The inside of a bis-

cuit should be flaky and dry. Thick, soggy, heavy biscuits impose a severe task upon digestion. Make the biscuits about two inches in diameter, and three-quarters of an inch thick. Bake them brown on both the top and the bottom. It is much easier to make light, wholesome biscuits with baking-powder than with soda. Buttermilk biscuits are very delicate and palatable, but not quite so certain to turn out well. If soda is not properly used you will have a yellow, evil-smelling compound, or else there will not be enough soda to make the biscuits rise, and they will be dangerously heavy. To make soda-biscuits sift one level teaspoonful of soda, one half-teaspoonful salt, and one quart of flour together three times so as to get the soda thoroughly well mixed in. Now rub two tablespoons of lard into the flour and add enough buttermilk to make a soft dough. Roll out into a sheet, cut into small thin biscuits and bake in a hot oven until well browned. Baking-powder biscuits are made in the same way, by using two teaspoonfuls of baking-powder in place of the soda, and sweet milk instead of buttermilk.

Yeast.—Put three hops in a pot containing two quarts of cold water. Place on the stove and see that it boils twenty minutes. Have a pint of flour in a large bowl and mix into it a tablespoonful of sugar, one of salt and a teaspoonful of ginger. Strain the water from the hops into this, stirring constantly. Allow it to cool. When lukewarm put in a cup of yeast or a yeast-cake.

Rolls.—At night take one half-cup of lukewarm

water, one half-teaspoonful of salt, three-quarters of a cup of yeast, and enough flour to make a thin batter. In the morning add to this a pint of milk, a teaspoonful of sugar, a half-cup of butter and beat in flour until it is no longer sticky. Set it in a warm place to rise and when well up knock back. Repeat this process, and when it comes up the third time make it into rolls. Let it rise once more and then bake it.

METHODS WITH CHICKEN.

The simplest and easiest way to cook chicken is to fry it. A poorly fed chicken is better stewed. For baking and broiling the chicken must be fat. In whatever way the chicken is cooked there is danger of its being tough, dry, stringy, and tasteless. Plain, artless, boiling results in insipidity. Quick, superficial frying means tough stringy fibres; and a hot oven frequently dries the meat until it is not fit to eat.

Fried Chicken.—All housewives think they can fry chicken, but the results are vastly different, according to the way it is done. You may have a tender, rich, delicious morsel, or tough masses of meat, stringy, tasteless and almost impossible to chew. Of course the condition of the chicken has a great deal to do with the results. A tender, well-fed chicken will fry far better and much more quickly than a thin, scrawny one. The thinner the chicken the greater the necessity for care in cooking it. It must be cooked slowly, over a moderate fire, in

a tightly covered pan, until it is perfectly tender. Melt a little fat in the frying-pan; flour, salt, and pepper the pieces of chicken and fry them in the fat until nicely browned on both sides. Now cover closely and place on the back of the stove where the chicken will steam for half an hour. When tender take up on a hot platter and put in the warming oven. Make a rich, brown gravy and pour over it.

Boiled Chicken.—Chickens may be boiled whole or cut into pieces. To boil whole place a few pieces of unsmoked bacon in a stew-pan that is deep enough to hold the chicken and can be tightly covered. Cook slowly for an hour without adding water, turning it often until it is evenly browned. Now add a small onion, some raw peeled potatoes not larger than an egg, and a little boiling water. Cook over a brisk fire for three-quarters of an hour. Salt and pepper the chicken and put it and the potatoes in a baking-dish in a hot oven while making the gravy. A couple of hard-boiled eggs chopped very fine, and a little chopped parsley, improve the gravy.

Baked Chicken.—A properly baked chicken is tender, juicy, and has a rich flavor, while one improperly baked is tough, dry, stringy, and tasteless. To bake a chicken properly the oven must not be too hot; the chicken must be repeatedly basted, and cooked until it is tender, but not until all dried up. Stuffing the chicken improves the flavor. To make the dressing, melt enough of any kind of wholesome fat in a hot frying-pan to keep the bread crumbs from sticking, and fry in it a large onion, chopped

fine, until it is tender. Place the dry bread-crumbs into the fat, and cook for half an hour over a slow fire, stirring often to keep from sticking, until the crumbs are slightly browned and well dried. Season with salt, pepper and a little celery-salt, and moisten with just enough milk to make it stick together. Always taste the dressing to see if it is properly seasoned. A well-fed chicken can be baked more rapidly than a thin one. If the chicken is thin add plenty of fat to the water in the baking-pan; cover closely and cook slowly and carefully until it is tender, turning very often; if it is fat and well-fed put plenty of wholesome grease in the baking-dish, and without covering it, cook in a hot oven, basting frequently. A young, fat chicken will bake in an hour. An older fowl may require two or three hours. It is a good plan to allow the chicken plenty of time and then, if done too soon, to cover it closely and keep it warm on the back of the stove. Use just enough water while baking to keep the fat from sputtering. If the water is cooked out towards the end, and the chicken is thoroughly basted, the skin will take on a rich, thick glazing that is highly creditable to the skill of the cook. Delicious gravy can be made of the fat by adding milk and thickening with flour.

Smothered Chicken.—Use a frying-size chicken. Split it down the back and rub with a little salt. Put it in a pan with a slice of bacon and a pint of water. Cover the pan closely and let it simmer on top of the stove from one to two hours, or until

the chicken is thoroughly tender. When done sprinkle with flour and baste well. Add a small tablespoon of butter, and put in the oven and cook until brown.

Broiled Chicken.—A young, tender, fat chicken is better broiled than any other way. It has a finer flavor; is tenderer, more juicy and more easily digested; in fact broiled chicken is one of the most delicious dishes that can be served. There is no earthly use, however, in trying to broil a chicken that is not fat and nice. If the chicken is a little too old to broil whole the breast will still be tender. Flatten the chicken by pounding it. Have a bed of clear, bright coals and a hot gridiron well greased to prevent sticking. Cover with a baking-dish and turn often, allowing the bony side to stay down longer than the other side. From fifteen to twenty minutes should be enough, but it is always best to test with a fork by pulling the fibres apart to see that they are not raw. As soon as the raw look has disappeared the chicken is done. The least over-cooking injures the flavor. Serve on a hot platter. Pour over a little melted butter, seasoned with lemon juice and chopped parsley.

To bake or boil a turkey proceed the same as for chicken, simply allowing more time. An eight-pound turkey will require three hours to roast.

MAKING GOOD SOUPS.

Vegetable Soups.—The simplest and most easily prepared soups are those made from peas, beans,

tomatoes, asparagus, celery, carrots, onions, and potatoes. They require neither meat nor any previous preparation, but can be made and eaten at once. These soups are somewhat paradoxical because they are both cheap and rich; deliciously simple and simply delicious. Take enough of any of these vegetables to furnish sufficient soup after they have been rubbed through a strainer and thinned with milk or cream. Cook the vegetables thoroughly until perfectly soft, so that they can be easily rubbed through a coarse strainer. Add enough milk to this purée to make it about the thickness of cream. Season with salt, pepper, and a little celery-salt, and serve with bits of bread browned crisp in the oven.

When the vegetables can be got fresh from the garden nothing is more delicious than these soups, and in winter, canned peas and dried beans make excellent substitutes. In making potato purée two onions boiled with the potatoes improve the flavor. Potato soup without onion is tasteless; a little celery boiled in with the potatoes and onion, makes it still nicer. Tomato soup is also better slightly flavored with onion and a little carrot. A little cold boiled rice, simmered for a half-hour in the soup after the milk has been added, is an excellent addition. These soups are also delicious when made rather thin with milk and then thickened by putting the well-beaten yolks of two eggs into the hot soup-tureen, and stirring vigorously while adding the soup; this last soup must be served at once, as it cannot stand after the eggs are added.

Meat Soups.—These soups should always be made the day before required in order to thoroughly remove the fat, which cannot be done until it hardens on the top of the soup. Nothing is more disgusting than greasy soup. The foundation for an infinite variety of soups is made by boiling about a pound of meat in three pints of water. After the meat is cooked to pieces strain it out and keep the well-skimmed liquor, or "stock," as it is called, in a stone jar in a cool place. It should form a jelly, and in order to prepare a different soup for each day, it is only necessary to heat some of the jelly and flavor it differently. For instance: Chop fine one small onion to each person and fry it in butter, or in some of the grease taken off the soup, until tender and slightly brown. Pour over enough stock and let stand for half an hour. Serve with a little grated cheese. Cabbage soup is made in the same way except that it takes longer to cook the cabbage. Instead of one vegetable several may be used. Turnips, cabbage, onions, and carrots in about the same proportion, chopped fine and fried tender, without any water, and added to the soup, make what is known in France as Julienne soup.

EGGS IN SEVERAL FORMS.

Coddled Eggs.—The most delicate way to cook an egg is to coddle it. Put six into a vessel that will hold two quarts. Fill with boiling water, cover closely, and let it stand in a warm place for ten minutes. If you desire them better cooked let them

stay in the water longer. If you want to do but one egg, put it in a quart of boiling water, cover and let stand five minutes.

Shirred Eggs.—To shirr an egg break it into a saucer or any small dish that has been well greased. Put into a hot oven and leave until glazed. Season and serve at once.

Scrambled Eggs.—Heat a teaspoonful of milk to each egg in a sauce-pan not more than a quarter of an inch deep and about the right size to hold the quantity of eggs desired. Add a little salt, pepper, and butter. When hot put in the eggs, and as they lie on the bottom of the pan, scrape off with a spoon letting the raw part take the place of those portions already cooked, and continue this until a creamy custard is formed. Be careful not to cook the eggs so long that this custard is changed to a hard mass.

PROPER COOKING OF VEGETABLES.

The general tendency in cooking vegetables is to use altogether too much water so that they become soaked and tasteless. The ideal way to cook most vegetables is to use as little water as possible; just a little in the bottom of the pot so that the vegetables will not stick and burn, but steam through in their own juices until thoroughly tender and full of their own flavor. The fire should not be too hot; the pot should be tightly covered; a sufficient amount of butter must be added when the vegetable is about half done; and plenty of time given to allow it to simmer and steam until thoroughly flavored.

Onions, beans, carrots, and cabbage are most delicate when chopped fine, cooked until tender in a very little water, seasoned with salt, pepper, and butter, covered with milk, and allowed to stand on the back of the stove for twenty minutes until the flavor is thoroughly developed.

Boiled Potatoes.—Potatoes should not be peeled before boiling, but should be thoroughly washed and rinsed. They should be put in an abundance of boiling water, well salted, and covered tightly. When tender pour off all the water, cover the pot with a towel and let it stand on the back of the stove for ten minutes.

Baked Potatoes.—If baked potatoes stand they lose their flavor. A baked potato, eaten as soon as done, is sweet, dry and mealy. Allow them to stand even for ten minutes and the flavor is lost, and they become wet and tasteless. A pleasant change is to peel the potatoes before baking. These must be eaten as soon as they come from the oven or they lose their crispness.

Beans.—Nothing is more valuable for winter food than beans. They give as much strength as beefsteak and are far less expensive. Soak them in plenty of water over night; add a generous piece of unsmoked bacon; let simmer on the back of the stove until they are tender and the water is well cooked away; cover with milk, and either let them stand on the back of the stove until the milk is thickened, or put them into a shallow baking-dish and bake until nearly dry. Serve either hot or cold.

SOME CAPITAL DESSERTS.

Apple Pudding.—Peel and slice enough apples to nearly fill your pudding-dish, sugar to taste, and grate over them a little nutmeg. Also add a little water. Now make a batter as follows: Three quarters of a cup of sugar; a piece of butter the size of a small egg, one half-cup of milk, one egg, a pinch of salt, a teaspoonful of baking-powder, and one and one-eighth cups of flour. This is an extremely nice, wholesome pudding, which can be served with either cream or hard sauce.

To make hard sauce take a half-cup of butter and cream it with a fork; add a cupful of sugar and beat until nicely mixed and creamy. Flavor to taste and sprinkle a little nutmeg over it.

Cottage Pudding.—One cupful of sugar, one tablespoonful of butter, one half-cupful of milk, two eggs, one and one-half cupfuls of flour, and one teaspoonful of baking-powder. For the sauce, take three and a half cupfuls of boiling water and stir in it a cupful of sugar, and a tablespoonful of either flour or corn-starch rubbed smooth with a little cold water. Cook well for two or three minutes; take the pan from the fire, add the butter and flavor as you prefer.

Batter Pudding Boiled or Baked.—One quart of milk, six eggs beaten separately, six tablespoonfuls of flour worked gradually into the yolks of the eggs, and a pinch of salt. Bake or boil about three-quarters of an hour. Serve with sauce.

Cream of Corn-starch.—One quart of milk, four eggs, one half-cupful sugar, four tablespoonfuls of corn-starch dissolved in a little milk. Into a pint of the milk put the sugar, and place on the stove to heat. When very hot gradually stir in the corn-starch and beat well. Have ready the whites of the eggs, and beat them into the milk; flavor as preferred. Take the other pint of milk, the four yolks and four light tablespoonfuls of sugar, and place them over the fire, stirring constantly. This makes a nice custard. Just before serving pour the custard over the pudding.

Caramel Custard.—One egg for each person; also one teaspoonful of milk for each person. Put the yolks and milk together with a tablespoonful of sugar to each egg. Have ready some caramel, and stir in enough to give a decided flavor. Put this into cups or baking-dishes, and set in a pan of hot water on top of the stove for twenty minutes; then in the oven until the custard sets. Serve cold. For the caramel, take two cupfuls of sugar (preferably brown) and put it in a frying-pan with a teaspoonful of water. Cook until well burned. Add a cup of water, and, when cold, put it in a bottle or fruit-jar. This quantity will last a long time.

Brown Betty Pudding.—Take a cupful of grated bread-crumbs, two cupfuls of finely chopped, tart apples, half a cupful of brown sugar, a teaspoonful of cinnamon, and one tablespoonful of butter. Butter a deep pudding-dish, and put a layer of apples on the bottom; then sprinkle with sugar, cinnamon and

bits of the butter. Put in another layer of apples, and proceed as before until all the ingredients have been used. Cover the dish and bake for three-quarters of an hour in a moderate oven; remove the cover now and brown the pudding. Serve with sugar and cream.

Rice Pudding.—One cupful of boiled rice (better if still hot), three cupfuls of milk, three-quarters of a cup of sugar, a tablespoonful of corn-starch, and two eggs; add flavoring. Dissolve the corn-starch with a little of the milk, and stir it into the rest of the milk; also add the yolks of the eggs and the sugar beaten together. Put this over the fire and when hot add the rice. Stir it carefully until it begins to thicken, then take it off and add the flavoring. Put it into a pudding-dish and bake in the oven.

THE END

INDEX

A

Accidents, 223.
Acid, carbolic, for *Rhus* poisoning, 260; in wounds, 231; poisoning by, 253; of fruit, 133, 146; picric, 241; uric, 149.
Acrodinia, 9.
Agaricus campestris, 256.
Air, 181.
Air-space, 45.
Albumen, 105.
Albumins, 98, 104, 117, 131.
Alcohol and its effects, 155; for *Rhus* poisoning, 260; of no value in snake-poisoning, 270; predisposes to consumption, 183; predisposes to heat-prostration, 244.
Amanita muscarius, 258.
Amanita phalloides, 257.
Ammonia, aromatic spirits of, 259.
Anaphylaxis, 204.
Ancistrodon contortrix, 263.
Ancistrodon piscivorus, 262.
Animals, bites of, 249; location of quarters, 61.
Anopheles, 41, 171, 174.
Antidotes for poisons, see under names of poisons.
Antiseptics, 231, 247.
Antitoxin, for diphtheria, 198, 203; for lockjaw, 233.
Apples, 147.
Arrowroot, 112.
Arsenic, 252.
Arteries, 229.
Artichokes, 136.
Asparagus, 142.
Atropine, 259.

B

Bacillus tuberculosis, 179.
Bacillus typhosus, 186.
Bacon, broiled, 282; curing of, 280; fried, 282; importance of, 121, 122; unsmoked, 282.
Baking, process of, 166.
Baths, for sick people, 221; hot and cold, 13; importance of, 12; sea, 5.

Beans, bad, give lathyrismus, 9; how to cook, 294; value of, 133, 134.
Bed-bug, 9.
Bedmaking, 219.
Beef, broiled, 275; fried, 275; Hamburg steak, 274; hashed, 276; pot-roast, 274; roast, 273; value of, 20.
Beer, 162.
Beets, 136, 138.
Beri-beri, 113.
Beverages, 30; alcoholic, 32; medicinal, 33; "soft drinks," 32.
Biliousness, 93.
Biscuits, 285.
Bites of animals, flies, mosquitoes and snakes, see under several subjects.
Bleeding, how to stop, 228; in consumption, 180; in typhoid fever, 187.
Blisters, 247.
Blood-vessels, 95.
Bottle, for infants, 73.
Brandy, 160.
Bread, and its relations, 104; baking of, 166; corn-bread, 108, 111, 285; diseases derived from decomposed, 9; graham-bread, 107; rye-bread, 108; why wheat-bread is the best, 106.
Bricks, 40.
Bright's disease, 95, 145, 156, 157, 158, 163, 173, 201.
Broncho-pneumonia, 201.
Bruises, 238.
Brussels-sprouts, 139.
Burns, 240.
Butter-milk, 150.

C

Cabbage, 138.
Cake, 115.
Calomel, 94.
Calories, 102.
Carbohydrates, 98.
Carron-oil, 241.
Carrots, 136.
Cat, conveys diphtheria, 10; harbors tapeworms, 10.
Cauliflower, 139.
Caustic, 213.
Celery, 141.
Cellulose, 131.
Cereals, 284.
Charlatans, 7.
Chewing, 29.
Chicken, baked, 288; boiled, 288; broiled, 290; fried, 287; smothered, 289.
Chickory (salad), 142.
Chilblains, 246.
Child, diseases of, 82, 89; exercise of, 79; hygiene treatment of, 88; ill-treatment of, 64; instruction in cases of accident, 223; sleep necessary to, 79; syringe for, 84.
Chills-and-fever, see Malaria.
Chocolate, 31.
Cholera, 8, 9, 140.

Chromic acid, 209.
Cisterns, 59.
Clams, 122.
Cleanliness, 220.
Clothing, 18.
Cocoa, 31.
Cod-liver oil, 125.
Coffee, 31, 151.
Cold, accidents arising from, 41.
Cole, 139.
Colic, cause of, 67; treatment of, 84.
Collodion, 232.
Color, in clothing, 21.
Constipation, 85.
Cooking, 164, 170.
Copperhead, 263, 266.
Coral-snakes, 262, 263, 267.
Corn, 110.
Cornstarch, 112.
Corrosive sublimate, 231.
Cotton-mouth, 262, 266.
Cows, carry tapeworm, 51; infected with tuberculosis, 182.
Crotalus, 262.
Croup, membranous, 198; treatment of, 86.
Cucumber, 141.

D

Dandelion, 138.
"Death-cup," 257.
Dextrose, 126.
Diarrhœa, reason for, 144; treatment of, 82.
Diet, for the sick, 221; vegetarian, 130.
Diphtheria, conveyance of, 9; description and treatment, 198.
Dipsomaniac, 157.
Dirt-eaters, 196.
Diseases, avoidable, 171; contagious, 89; contraction of, 8; digestive, 82. See also names of diseases.
Disinfectants, 192.
Dog, conveys diphtheria, 9; dangers of, 62; description of rabies in, 211; harbors tapeworm, 9, 10.
Drinks, see Beverages.
Drowning, 224.
Dry-closet system, 53.
Dysentery, 8, 9, 43, 140.
Dyspepsia, 145, 158.

E

Earth, diseases contracted from, 8.
Eating, 28; importance of, 92; over-eating too prevalent, 95.
Eggs, coddled, 292; in vegetarian diet, 130; nitrogenous food, 118; scrambled, 293; shirred, 293; value of, 123.
Elaps euryxanthus, 263.
Elaps fulvius, 263.
Emergencies, 223.
Emetics, 251–259.

Endive, 142.
Ergot, 108.
Ergotism, 9.
Ethers, compound, 98.
Exercise, 79.

F

Fabrics, 20.
Fats, 98, 103; in vegetables, 131; unwholesomeness of, 115; value of, 123.
Fever, malaria, see Malaria; scarlet, 90; typhoid, contraction of, 8, 9, 43, 140, 221; description and treatment, 185; yellow, 9, 41, 43.
Figs, 146.
Filaria, 9.
Fireplace, 47.
Fish, decomposed, source of ptomaine poisoning, 9; nitrogenous food, 118; value of, 122.
Fly, conveyor of disease, 9, 10, 43; in sick-room, 219.
Fly-agaric, 258.
Flukes, 140.
Foods, 28, 99; albuminous, 119; amount necessary, 96; breakfast-foods, 113; diseases contracted from, 8; in sick-room, 221; Mellin's food, 86; nitrogenous, 98, 117; nutritive substances in, 98; raw, 105, 164; starchy, 104, 165, 168; tables, 100.
Formaldehyde gas, 192.
Frost-bite, 245.
Fruits, as food, 30; dangers in, 144; diseases contracted from, 9; not nutritious, 146.
Furnace, 46.

G

Game, 122.
Garlic, 140.
Gin, 160.
Glanders, 10.
Glucose, 126.
Gout, 156, 163.
Grape-fruit, 147.
Greens, 138.
Ground-itch, 195.

H

Haig, a physician, 148.
Ham, boiled, 281; broiled, 281; curing of, 280; fried, 281; wholesomeness of, 121.
Headache, 33.
Health, 5.
Heat, accidents arising from, 241; for house, 45; in sick-room, 218. See also Calories.
Heat-prostration, 244.
Hiccough, 250.
Hog, 51.
Hog-meats, 120.
Hominy, 284.
Hookworm, 8; method of transmission, 50, 52; description and treatment of disease, 193.

Horses, convey glanders, 10; killed by bad corn, 109.
House, materials for, 39; sanitation of, 35.
Husks, 107.
Hydrophobia, from dog's bite, 9, 249; description and treatment, 211.
Hygiene, 1, 6; of infancy and childhood, 63; of the person, 12; of the sick-room, 217.
Hypersensitiveness, 204.

I

Indigestion, 145.
Infants, hygiene and feeding of, 63; weaning of, 67.
Iodine, as antiseptic, 231; in blisters, 247.

K

Kak-ke, 9, 113.
Kala-azar, 9.
Kissing, 89.

L

Lathyrismus, 9.
Lead-water, 261.
Leeks, 140.
Legumes, 133.
Legumins, 98, 118.
Lemons, 146.
Lentils, 133, 134.
Lettuce, 139.
Ligature, 230, 270.
Lime-water, 71, 261.
Liquids, 148.
Liquors, malt, 162.
Liver, 93; cirrhosis of the, 158.
Lockjaw, 227; antitoxin for, 232.
Loeffler, discovered diphtheria germ, 198.

M

Malaria, conveyed by mosquito, 9, 41, 43; description and treatment, 171.
Maltose, 86.
Massasauga, 266.
Mastication, 96.
Meat, cooking of, 168; nitrogenous food, 118; source of ptomaine poisoning, 9; value of, 119.
Medicine, 221; patent, 91, 158.
Menniges, 207.
Meningitis, cerebrospinal, 206.
Micrococcus intracellulais, 207.
Milk, an ideal food, 128; apt to promote indigestion, 150; as a drink, 31–32; in vegetarian diet, 130; infected with tuberculosis, 182; malted, 86; modified cow's, 67; mother's, 65; peptonized, 75; sterilized (Pasteurized), 74; table for cal-

culating proportions of milk to be fed, 70.
Mint, 142.
Moccasin (snake), 261, 262, 263, 266.
Mosquito, 9, 41, 171, 173.
Mouse, 9.
Mushrooms, 256.
Mutton, boiled, 283; chops, 284; cutlets, 283; roast 283; value of, 120.

N

Necator Americanus, 193.
Nervousness, 88.
Nipple, 73.
Nose, 184.
Nursing, 217.

O

Oatmeal, 114, 284.
Okra, 142.
Opiates, 85.
Opium, 254.
Oysters, 118, 122.

P

Pains, rheumatic, 145.
Paris green, 252.
Parsley, 142.
Parsnips, 136.
Pasteur, 214.
Pastries, 115.
Peaches, 146.
Peanuts, 133, 134.
Peas, 133, 134.
Pellagra, 9, 109.
Peppers, green, 142.
Phosphorus, 253.
Pickles, 144.
Pieplant, 142.
Pilot-snake, 262.
Pit-vipers, 261, 265.
Plague, bubonic, 9.
Plasmodium malaria, 171.
Plaster, for blisters, 247; for sprains, 235.
Poison-dogwood, 260.
Poison-elder, 260.
Poison-ivy, 259.
Poison-oak, 259.
Poisons, acid and alkaline, 252; ptomaine, 9; treatment of poison cases, with antidotes, 251.
Poison-sumach, 260.
Pork, boiled, 280; broiled, 279; fried, 279; roast, 279.
Potassium permanganate, 254, 255, 269.
Potatoes, 135, 136; baked, 294; boiled, 294; cooking of, 167; disadvantages of, 112.
Poultry, 122.
Privies, 49, 52, 198.
Ptomaines, poisoning by, 9.
Puddings, apple, 295; batter, 295; brown betty, 296; caramel custard, 296; cottage, 295; cream of cornstarch, 296; rice, 297.
Pumpkin, 143.
Pus, 232.

Q

Quacks, medical, 4, 7.
Quinine, 173.

R

Rabies, see Hydrophobia.
Radishes, 136.
Rat, 9.
Rat-poison, 25.
Rattlesnake, 261, 262, 264; ground-rattlers, 262, 265.
Recipes, 273.
Resins, 231.
Respiration, artificial, 225.
Rest, need of, 22.
Rhubarb, 142.
Rhus, poisoning by, 259.
Rhus toxicodendron, 259.
Rhus venenata, 259.
Rice, boiled, 285; cooking of, 167; value of, 113.
Rochdale, system of, 53.
Rolls, 286.
Rum, 160.

S

Salad plants, 139.
Saliva, 29.
Sanitation, 35.
Sauerkraut, 139.
Scab, 233.
Schafer, Prof., system of artificial respiration, 225.
Screens, 41, 176, 219.
Sewage, disposal of, 49.
Shallots, 140.
Sheet, rubber, 219.
Sick-room, 217.
Sistrurus, 262.
Sleep, 26, 78.
Sleeping-sickness, 1.
Snake, harlequin, 262.
Snake-bites, 268.
Snakes, columbine, 262, 263; elapine, 263; non-venomous, 264; venomous, 261; viperine, 261.
Soups, meat, 292; vegetable, 290.
Sours, 147.
Spinach, 138.
Splints, 235.
Sprains, 234.
Sputum, 184.
Squash, 143.
Starches, 98, 104; changes in, 165; in cooking, 97; in vegetables, 131; raw, 105.
Steam, 46.
Stove, 47.
Streams, 60.
Strychnine, as antidote, 269; poisoning by, 254.
Sugar, consumption of, 126; from beets, 136; in vegetables, 131; kinds of, 125; raw, 105.
Sunstroke, 242.
Swamp-dogwood, 260.
Syringe, 84.
Syrups, 33; soothing, 255.

T

Tapeworm, 8, 9, 51.

Tea, 31, 152.
Teeth, care of, 80, 248; teething of infants, 80; toothache, 248.
Toadstool, see Mushroom.
Tobacco, 34.
Tomato, 141.
Tonsilitis, follicular, 200.
Toothache, 248.
Treatment, immunizing, 205; pasteur, 214.
Tricina, 18.
Tuberculosis, 94, 95, 156; description and treatment, 178.
Tubers, 135.
Turnips, 136, 137, 138.

V

Vaccination, 88.
Veal, boiled, 277; fried, 277; jellied, 278; roast, 276; stew or pot-pie, 277.
Vegetables, cooking of, 293; digestibility of, 132, 133; diseases contracted from, 9.
Ventilation, 48, 218.
Vinegar, 133, 136, 147.
Vipers, 262. See also pit-vipers.
Vomiting, 67, 87.

W

Waffles, 107.
Wall-paper, 41.
Water, as a drink, 30, 148; dangers of, 140; diseases contracted from, 8; for heating, 46; for poisons, 251; for wounds, 230.
Water-supply, 57.
Wells, 58.
Whisky, 160.
Wines, 161.
Work, 22.
Worms, 140.
Wounds, 227.

Y

Yams, 135.
Yeast, 286.

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